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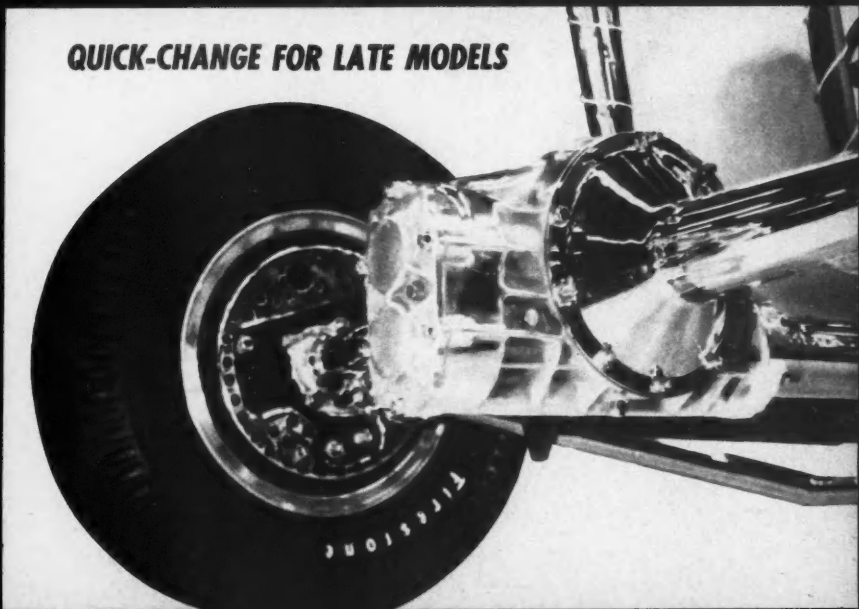
NOVEMBER 1969

25c



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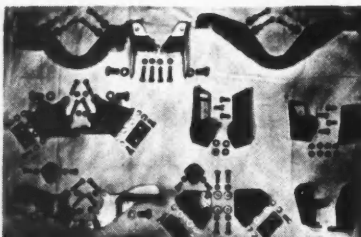
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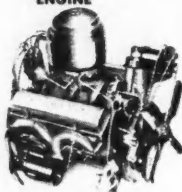
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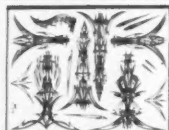
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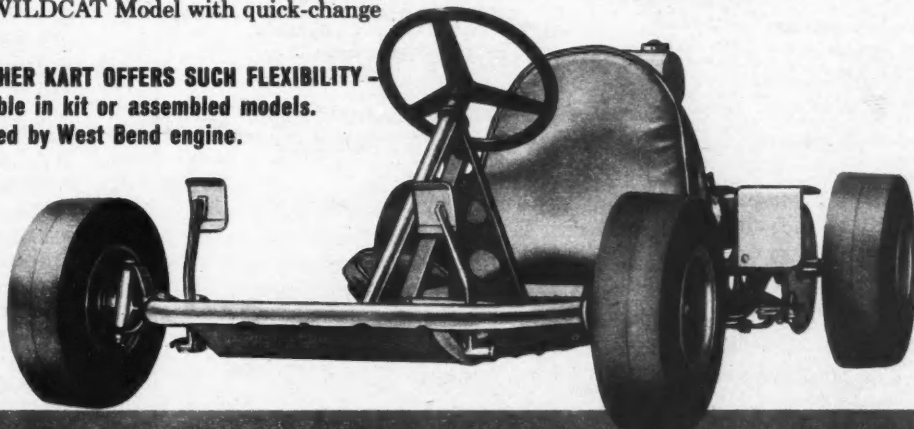
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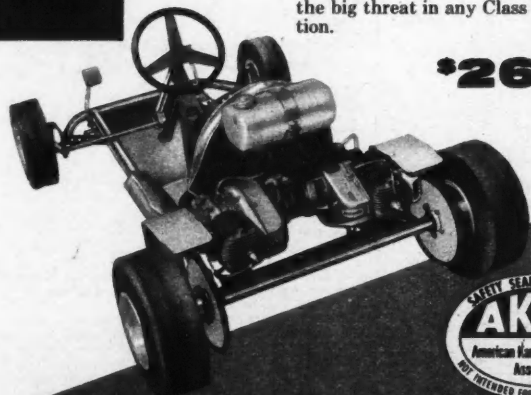
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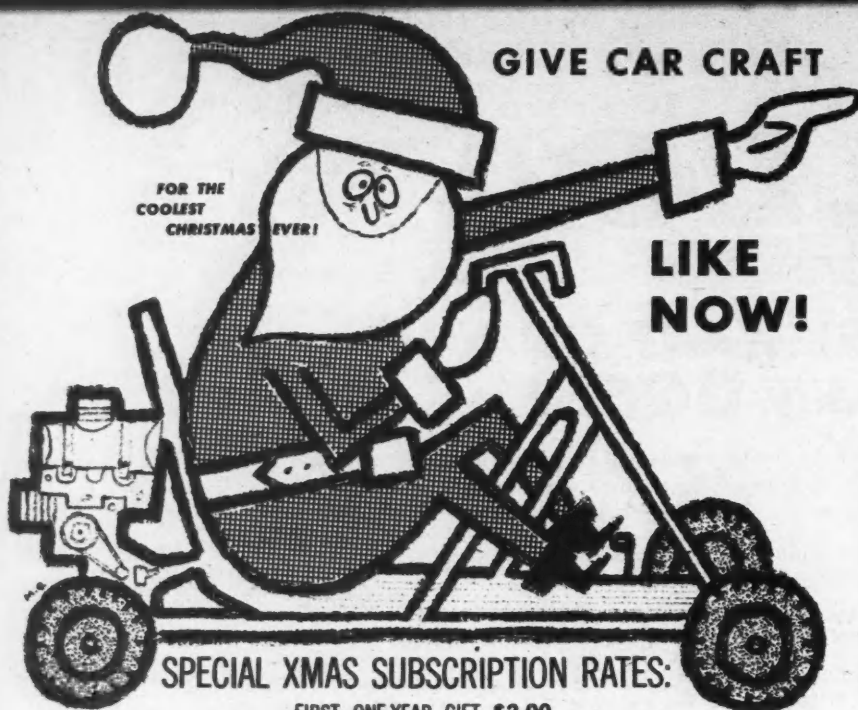
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A 5,250 mile test run taking seven days and nights

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cover

Competition is the theme for this month's cover. For full information on Jocko's dragster, blower drive adaption kits, and installing a quick-change in a late model — see inside.

— Anacochromes by Lang D'Olivo, Day

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of

the editor



THE YOUNG TEENAGE lad pic-
tured above is known to his neigh-
borhood pals in Burbank, California,
as Phil Dorsch. Only a few weeks
ago, Phillip drove his Wahlborg quar-
ter midget to victory in the senior mod-
ified racing division at the recent Tulsa
quarter midget nationals (see page 20).
In fact, to set the record straight, he
not only walked away with the top
national honors for his division but also
set fastest qualifying time for his class.
You might not find the importance of
these achievements until you stop to
consider that young Dorsch accomplish-
ed these feats—alone! True, he had the
assistance of his parents, but under
rather strange circumstances. His father,
who was compelled to remain at home
due to his occupation, pre-tuned his
race car's powerplant before stowing it
in the trunk of the family car for safe
keeping while enroute to Tulsa. His
mother's role in the combined parental
assistance was the part of the chauff-
eur, whereby she drove Phil, the car
and engine to the race site some fifteen
hundred miles away. Once the boy was
delivered and signed in by the race offi-
cials, mother quickly retired to the
shade of the grandstand. For the next
three days of the championship event—
Phil was strictly on his own. First came
the car preparation; installation of the
engine and assembly of the drive line.
Early practice laps uncovered the need
for last-minute tuneup modifications
necessary to place the car in peak per-
formance. And the all-important track
strategy of locating the fastest and best
groove had to be defined. These were
just a few of Phil's many mechanical
chores and personal decisions while
competing against some of the country's
best drivers and cars. Of course, the

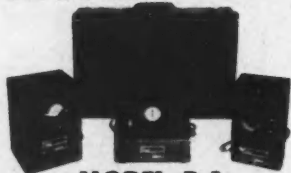
final day's results of fast time and cap-
ture of the coveted national title all but
put a storybook ending to Phil's success-
ful and enjoyable exploits. Strange...
but only recently someone commented
to me "quarter midgets... they're strict-
ly for the old man and the hot engines
he can stuff in 'em... the kids are
nothing more than implements for
driving?"

Continuing success and unanimous
acceptance seems to be the future trend
for CAR CRAFT's new technical writer,
John Geraghty. His August offering of
"Super-Tuning Your Impala" was a real
winner if phone calls and letters from
congratulatory well-wishers are any cri-
terion. In addition to the current series
on "Racing Blowers" which is in its
second installment in this issue—John
now serves a tender morsel to whet the
appetite of drag racers everywhere. It
concerns the adaptation of a quick-
change rear end to any late model car.
Needless to say, the guy who can split
hairs when it comes to selecting gear
ratios out on the strip as compared to a
fellow contestant who is compelled
to settle for a close-as-I-can-get combi-
nation of factory available gear ratios
and specialized tire sizes, holds a de-
finite edge over his competitor if horse-
power beneath the two hoods are any-
where comparable. And when we swing
to the rapidly becoming popular 660
acceleration tests, what could be more
ideal than a multiple selection of gear
ratios for the short-but-quick one-
eighth of a mile blast. Precise and selec-
tive gearing will undoubtedly come into
play more than ever before. Beefie axles
for starting line pressure is also a spe-
cial part of Geraghty's rear-end feature
this month. I'm sure you'll agree it's a
comprehensive report.

— Dick Day
CAR CRAFT

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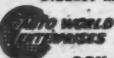


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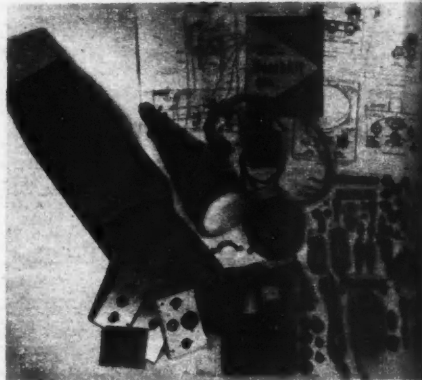


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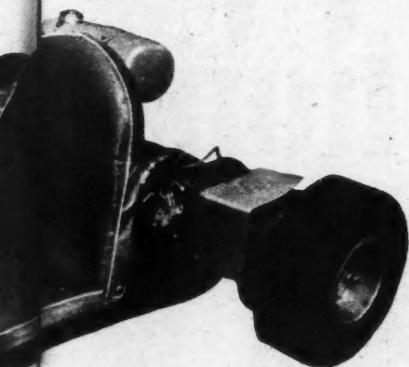
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sembly. Detroit Grille Mfg., Dept-cc,
258 E. Vernor, Detroit, Mich.



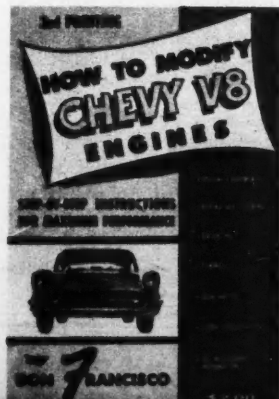


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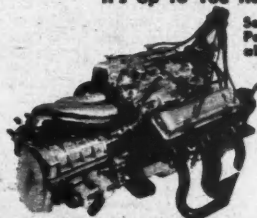
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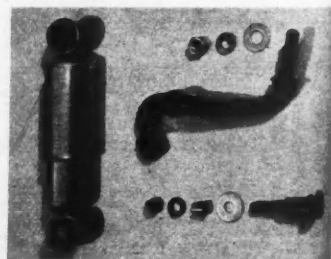
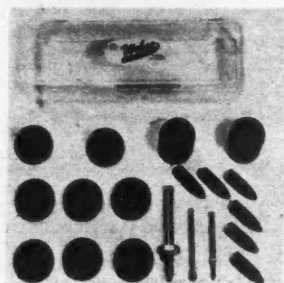
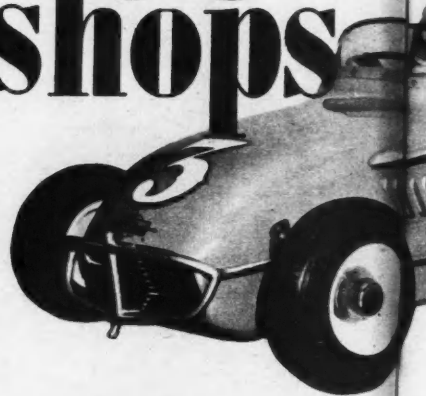
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MODEL CATALOG

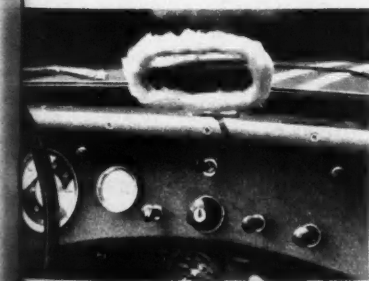
If you are a model car fan, then you'll appreciate this new catalog listing practically every scale-model car in the world. Price: \$0.25. Write, Auto World Enterprises, Box 806-cc, Scranton 2, Pa.

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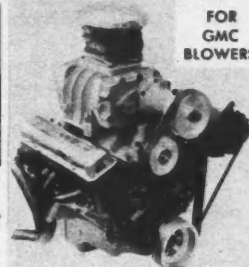
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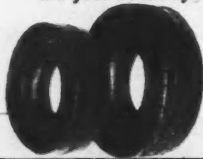
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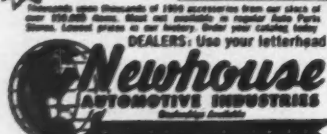
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LETTERS

\$100 CUSTOM CLASHES

Dear Sir:

After reading your August, 1959, issue, I sat and pondered for hours. Was it satire? Was it MEANT to be the joke it was?

I have been reading CAR CRAFT avidly since I was 15 and first became interested in custom cars. Occasionally, in the past, you have pictured a car or two that I thought a little hideous...but that is individual taste. But, never in those five years have I seen anything, in any magazine, that was a bigger insult to the intelligence and taste of your readers than your "\$100 Custom" on pages 14-19.

A better title for that article would have been "How To Build A Junk Heap for A C-Note."

Every aspect of that car was either bolt-on gunk; needless mess; or good ideas that were poorly executed. For example...

Chrome headlight brows juvenile clutter
Decals messy clutter
Satel-lite Taillights childishly hillbilly
Chrome Bullets bolt-on gunk
Exhaust pipes poorly done
As the former owner-builder-designer of a true California custom, I seriously wonder why you didn't add:
Mud flaps with reflectors
Four aerials with fox tails or TV antennas
Lit up port holes
Three hood ornaments
Fender mirrors
Corvette Flags (worth at least 10 hp)
Chrome sunvisor

since these would be perfectly in tune with the trashy appearance of your Ford.

I would rather throw my \$100 in the garbage pail than spend it as erratically as you have done. Basically, the same end results would be achieved.

Print this...I'd like to get the opinions of other readers. Myself, I'd be ashamed, I'd feel so foolish, to even stand near this...this...thing.

Any more "jokes" like this and I'll go back to reading PLAYBOY, and not even bother to open your mag.

—Tony Hyman,
Redlands, Calif.
USN in Hawaii

Dear Sir:

In your August edition you showed how to customize a '57 Ford. In the article you gave a price list of things purchased. I am wondering though why you didn't use less expensive equipment. If you had you could have saved up to \$29.00 or maybe even more. Then you could have used this money on something else. Included with this letter is a list of the prices I found advertised in your magazine compared with the prices you had down. I have just started to read "Car Craft" but I think it's tops.

price you listed	ads
Tubular grille \$29.95	\$19.95 J. C. Whitney Co.
Satel-lite kit 14.95	12.95 Roth Studios
Headlight brow 3.95	1.95 Honest Charley Speed Shop
Moon hubcaps 14.95	10.80 Honest Charley Speed Shop
Exhaust extensions 19.90	9.95 Honest Charley Speed Shop

—Ralph,
Detroit, Michigan

Dear Sir:

\$100 Custom. Wow what a pile. If one is going to customize on a budget how does he start with a '57???

I saw your Aug issue on the newsstand and turned to the roadster. I bought the mag. When I got home and saw that \$100 job I nearly got sick. What's wrong with you people? Most of your features are pretty good. Decal Scallop oooh.

Here is the way the \$100 would be spent around here.

lower	\$15.00
lake plugs	30.00
install plugs	11.00
spinners	25.00
tube grille	30.00

\$111.00

A little bit more, but a custom. Please don't let this happen again.

—Ed Johnson,
Casper, Wyoming

Well now, looks like we have a few differences of opinion. I think that the first thing we had better straighten out is the fact that the \$100 custom story was not a story designed to tell you that this is the way to customize the '57 Ford. The actual make and model automobile that is used in this feature has little to do with the idea which we are trying to convey to the reader. The whole basis of this story is to emphasize that many car owners think they want a custom car, but draw-back when they discover custom charges. Therefore, they go without a custom. With the increased emphasis and growth of the accessory market, these owners do not have to go without. Sure they don't end up with frenched headlights or molded panels, but they do have a different appearing car from the run-of-the-assembly-line models they see on the road. And this is one of the primary purposes of customizing.

To reader Hyman, we can only say that your main objection is of individual taste in the selection of the accessory pieces. But then, you can't please them all. Before you sign off, wait for our next \$100 Custom. Perhaps you'll change your mind.

To reader Johnson, we suggest you re-read the article. This was a "How-to-do-it" article at home. We would be wasting money if we paid a shop to install our items. This is another goal of the \$100 series. You have chosen your route to customizing. There's nothing wrong with that. You've spent a little more money and have a little less than we. It's all personal selection, judgment and taste. Secondly, we assume that you OWN a car before you customize it. Isn't that the usual method? As for not being able to 'touch' the '57 Ford for \$100, if you mean the actual purchase price of the car, we agree. If you mean the customizing price, we disagree. Take a look at pages 14-19 in the August '59 issue.

And last but not least, reader Ralph from Detroit. We agree with you. If we had exercised a judicious search for the accessory parts, we probably could have saved nearly \$30, if not a little more. But, once again, let us repeat that the article is designed to show that there are parts which can be purchased for your car which will give a definite custom appeal. Perhaps we should have searched a little harder, but then, we pretty much cover the line of accessories for the '57 Ford. By this, we mean we could install only one taillight replacement kit. Or only one tube grille. Possibly we could have found a less expensive one to use, but nevertheless, we think we accomplished our purpose. However, if you own a '57 Ford, Ralph, and want to follow your selection, more power to you. And if you can't find anything to do with that extra \$30, you might remember you'll be able to subscribe to Car Craft for the next TEN YEARS! — Ed.

NOVEMBER, 1959



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Go Kart manufacturing company, Inc. 6305 Irwindale, Azusa, Calif

Further proof of Go Kart's quality and dependability was evidenced recently when a single engined Go Kart completed seven days and nights of closed road course running for a total of 5,260 miles. This was done without structural failure of stock Go Kart components and necessitated only routine maintenance and service. The full story, including many sidelights and photos, records set and other statistics may be had by writing for a free booklet. Ask for "Project Endurance", the story of how a consistent winner over the stopwatch went on to conquer the calendar as well.



QUICK CHANGE CONVERSION

Late model adaptability and stronger axles make the favored quick-change rearend more versatile than ever.

by John Geraghty

THE TIME WAS, not too long ago, when a quick selection of gears and a dash of some nitrate solution produced a champion. Unfortunately these good old days have vanished and with the local backyard hot rodder exploding all theoretical limits of possible acceleration and speed, we have been placed in a class with the accomplishments of the great teams of Auto Union and Mercedes Benz and many others. Squeezing those precious last few horses from a thundering 450 cubic inch supercharged engine is as important as ever, but without the proper gear ratio either a sluggish dud or a good stump puller could easily be the consequence.

Gear ratio is a topic that could easily fill the rest of this article with theoretical facts and geometrics, and formula after formula would still leave much unsaid and many things misunderstood. So we will concern ourselves with a few basic rules that when applied properly, will do the job—and do it right.

All engines whether they be factory stock production or modified to all possible limits have one thing in common, this is the specific engine R.P.M. where maximum horsepower is developed. To be able to apply these basic rules of selective gear ratios we must first determine this horsepower peak. A dynamometer is needed to determine horsepower rat-

ings in regards to R.P.M. If a dynamometer is not available a complete list of maximum horsepower R.P.M. figures may be found in most auto repair manuals for the stock production cars. Where special ground camshafts have been employed in a modified engine, figures can easily be obtained by contacting the cam manufacturer. These R.P.M. figures are the measuring stick for your car's performance whether it be the drags or high speed trials.

The first basic rule to remember is when accelerating over any given distance for maximum speed or elapsed time the final point; or finish line, of this distance should be reached with the engine turning approximately

200-400 R.P.M. above its maximum horsepower peak. This rule will assure the greatest quality of work to be performed by the engine and therefore maximum speed and acceleration will be the end result.

Determining the selection of a proper rear axle ratio is not difficult. I use the following basic formula.

$$\text{M. P. H.} = \frac{\text{R. P. M.} \times \text{Pi} \times \text{tire diameter}}{1050 \times \text{a selected rear axle ratio}}$$

Explanation of equations:

R.P.M. designates, 200 engine revolutions above the maximum horsepower point.

M.P.H. designates, miles per hour in hundreds.

Pi designates, a mathematical ratio of 3.1416.

Tire diameter designates, the length of a straight line through the center of a tire.

1050 designates, the constant amount of inches traveled per minute at one mile per hour.

The selection of gear ratio designates, gear selected by you to be checked by this formula before installation.

When determining the ratio for either low or second gear this same formula may be applied with one simple modification. The transmission ratio of low or second gear is multiplied by the rear axle ratio and this figure used in the formula substituting the selected rear axle equation. After the selected gear ratio has been installed and a trip down the drag strip has netted a higher R.P.M. than desired, a slightly higher gear or larger tire should be installed until the proper R.P.M. is attained. Once you have reached this R.P.M. the real super tuning in both engine and gear ratios may begin. Some minor changes in jet sizes or ignition timing may raise your maximum horsepower enough to boost your R.P.M. a couple hundred more revs and necessitate another gear change which will add a few more precious miles per hour or cut a couple tenths of a second off that e.t.

Several years ago Halibrand Mfg.

Co., and Cyclone Products (the latter being a subsidiary of Cook Machine Works) developed the famous quick-change center section in order to simplify these necessary gear changes and eliminate the necessity of including numerous stock rear end ratios and stacks of odd size tires and wheels as part of your racing equipment. The operation of a quick-change center section is basically very simple. The design is similar to a stock rear end only the pinion gear is in a reverse location. With a stock rear end, there are two main gears — the pinion and ring gear. The pinion gear extends through the front of the differential housing and is connected to the automobile drive shaft. As the pinion gear turns, the two gears being interlocked rotate together and with each complete revolution produce a definite ratio determined by the teeth of the pinion gear divided into the teeth of the ring gear. For example, the pinion gear of a 4.11 to 1 rear axle ratio has a combination of 9 teeth on the pinion gear and 37 teeth on the ring gear. Consequently the engine turns 4.11 times to each rotation of the rear wheel.

The ring and pinion gears function in this same manner with the use of a quick-change center section, however there are two major differences. Instead of the pinion being driven directly by the drive shaft and extending through the front of the case, the pinion gear extends through the rear of the housing and a solid shaft splined on both ends extends through the housing just below the pinion gear and is driven by the automobile drive shaft. Connection of this lower shaft and pinion gear is the determining factor of what the final gear ratio will be. The connection of these units is accomplished by placing the machined gears over the splined ends of the pinion gear and drive shaft which protrude from the rear of the case into a separate portion of the housing. These gears, produced by the manufacturer, come in various close-ratio sizes accompanied with a chart listing the proper combinations to arrive at for any desired ratio. With a quick-change center section, ratio alterations are just that. A flat plate is removed from the back of the center housing and another set

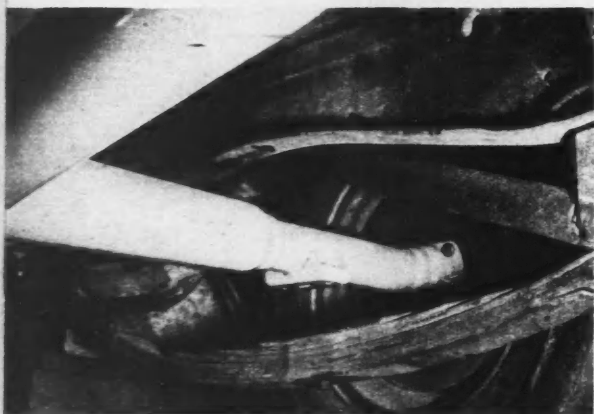
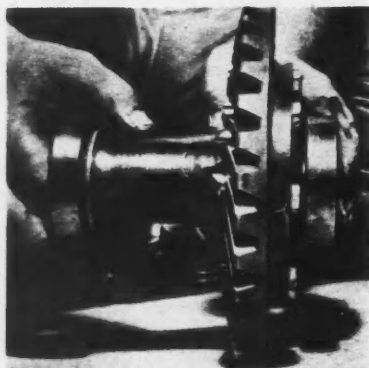


The special quick-change gears are positioned over reversed pinion gear and the lower driven shaft to interlock.

of gears can be installed in three to four minutes.

As with all good things there are always a few drawbacks. The quick-change center section has two. The first being that the unit can only be adapted to early Fords up to and including '48 models. The second disadvantage is that the rear end accommodates, due to design, only the same year axles. The torque and horsepower produced by even the stock factory engines of today will twist and break these early axles under extreme load conditions associated with drag racing. Although the quick-change rear end is still constantly being employed in professional racing with the use of open tube axles, a combination far too expensive for the average hot rodder, the special unit has been rapidly disappearing on the drag strip due to its objectionable features of not be-

QUICK CHANGE CONVERSION



After modifying the axle housing, the stronger late model axle can be put in place. The stock axle retaining plate serves as a safety hub when in place.

ing able to handle today's vicious torque load at the starting line. That was until the Cook Machine Shop in Los Angeles took a long look at the situation and came up with a solution for both problems. Mr. Cook not only solved the axle problems but also developed a few simple modifications for adapting the quick-change center section to any late model rear end. We need not expound on the advantage this holds in store for the weekend warrior who uses his car for the drags as well as everyday transportation. How can you beat the luxury of dropping in a ratio of 4.88 to 1 for Sunday drag racing, then just before leaving the strip, slip in a 3.70 for the ride home.

Our first modification will deal with the adaption of a quick-change center section to any late automobile. The first step in this modification is to purchase the following parts.

Complete Ford rear axle assembly 1940-1948 (used)	5.00
Axle housing only (used — same as type to be modified)	10.00
Carrier assembly (used — same as type to be modified) (see a)	4.00
Special spool carrier unit. (see b)	35.00
Quick-change center section. (see c)	250.00

The Cyclone unit can be ordered for this particular modification and comes with a choice of three gear changes included in the price.

Special reworked carrier and ring gear (see d) 20.00

- When ordering the special reworked carrier assembly this used carrier must be sent for reworking, or a core charge will be incurred.
- When ordering the special spool unit be sure to specify the year and model you intend to modify.
- Same as (b), and also specify whether you desire the spool or spider cage unit. This quick-change will come ready to install except for universal companion flange.
- Send a used carrier assembly including spider gears of the same type you intend to modify. Also send the ring gear from your quick change unit.

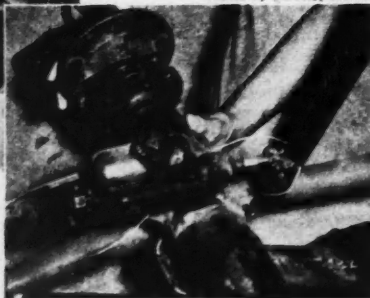
All parts may be ordered direct from Cook Machine Works, Los Angeles, California.

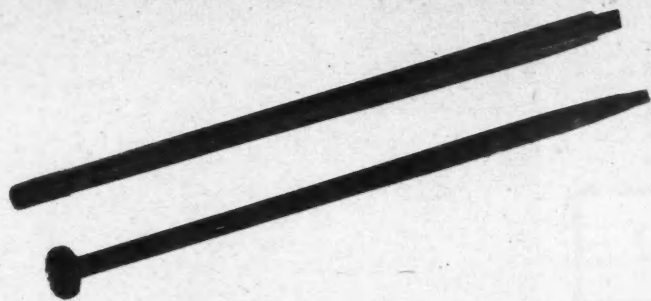
We suggest the purchase of a used axle housing so that the automobile in question may still be driven during preparation of the modified rear axle assembly. The late model axle housing is measured between the spring seats and a note taken on the angle of these spring seats in relationship to the pinion shaft. The measurement and angles must match the modified rear end assembly when completed. This housing must be cut approximately 4 inches from the spring seats toward the center on each end. Remembering that 1 inch of each housing shall be inserted into the Ford housings, the length of the late housing ends may be measured in the original manner and this figure

The top photo shows the special Cook spool with the ring gear and carrier bearings on.

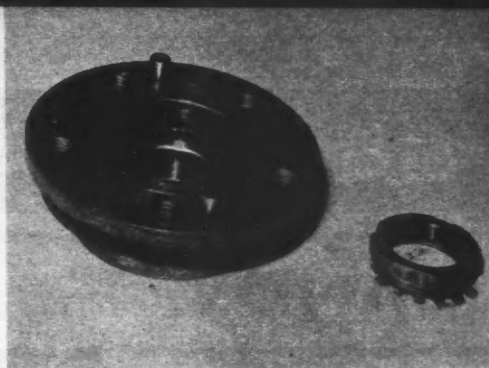
Stepped down section can be seen where late axle housing has been joined to the early housing. Spring hangers are re-mounted to align properly.

Photos by Palocz, Brothier

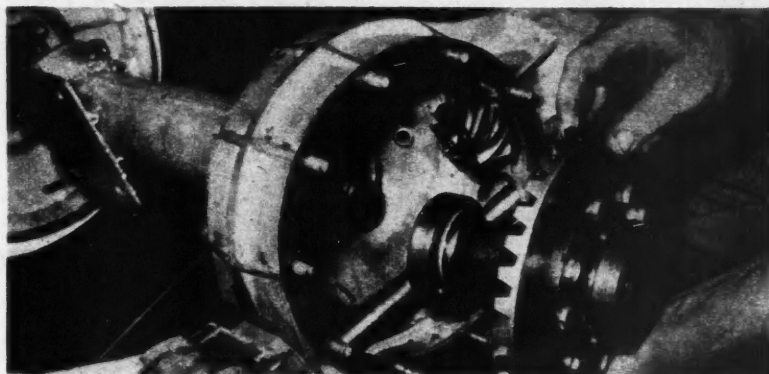




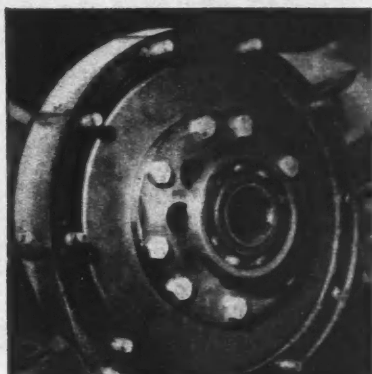
This photo denotes the obvious difference in size between stock early Ford axle and special axle made by Cook Machine Works. Note splined end for spool unit.



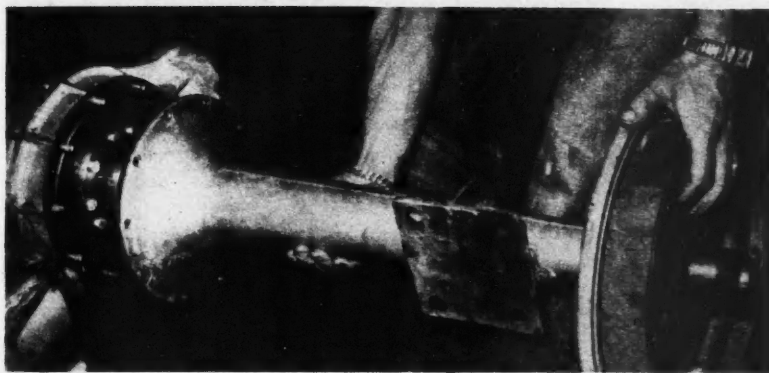
The Cook safety hub is a full ball bearing unit used with special Cook axles.



After installing the right axle housing, place special spool into the quick-change.



Here is the special spool assembly in place. Splined center drives the axles.



After the spool unit is in place, install axle housing on center section, tighten.



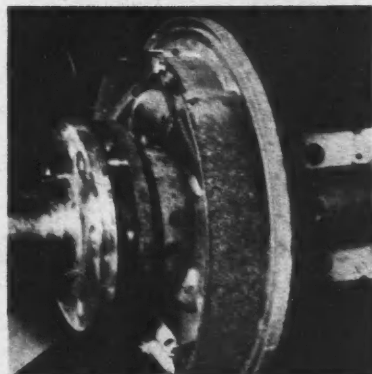
Housing ends are threaded to accept the retaining nut for the safety hub.



Cook safety hub may now be slipped over machined end of the axle housing.



Lock ring and retaining nut are tightened, locked in place with small clips.



Holes in the stock hub are lined up with safety hub, are held by wheel lugs.

dazzling

CANDY/PEARL

dazzler

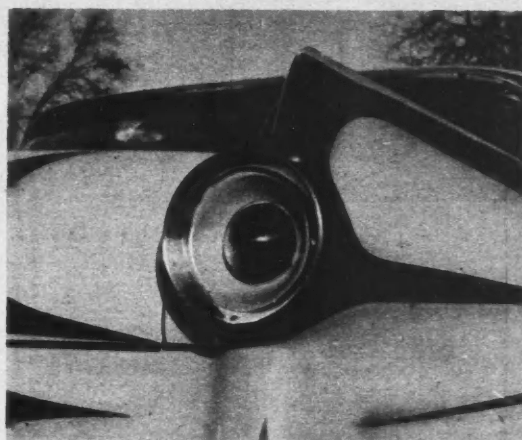


As the title above indicates, Jon Enberg's '57 Ford Victoria is painted in Pearl lacquer and scalloped with Candy Red. Custom work was done by Furtado's Body Shop in Enberg's home town of Modesto, Calif. Modifications took 2 months.



Both front and rear pans are rolled; bumpers are discarded. Front end features tubular bar grille in stock cavity minus parking lights. Bullet-type protrusions at ends of front pan are molded-in. Buick port holes added to dechromed hood.





Photos by George Barris



Novel taillights are restyled using the stock bullet lens mounted on a concave lens. Surrounding taillight unit is a '56 Ford pickup headlight ring.

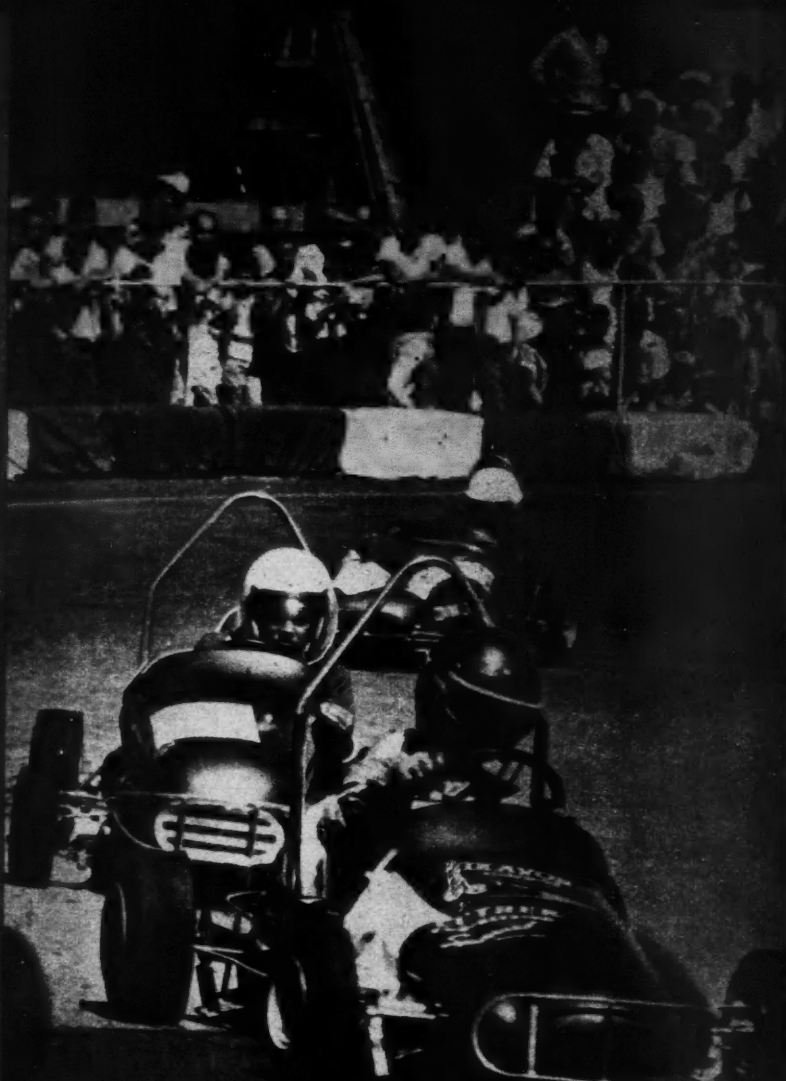
It's illegal to drive in California minus a front license plate, so Enberg has his mounted in center of a scoop cut in pan with an expanded metal screen fill-in.

Furtado's Body Shop chose to tunnel the headlights in popular '57 Ford manner by adding chrome rings from a '56 Ford pickup truck. Note tip of rolled pan.

FAR LEFT • Stock side trim is retained. Lowness of Ford is due to cut coils in front with rubber spacers between each turn and lowering blocks in the rear.

TULSA NATIONALS

TEXAS
CALIFORNIA
KANSAS
OKLAHOMA
OHIO
MISSOURI
WEST
VIRGINIA
NEBRASKA
ARIZONA
NEW MEXICO
INDIANA
LOUISIANA



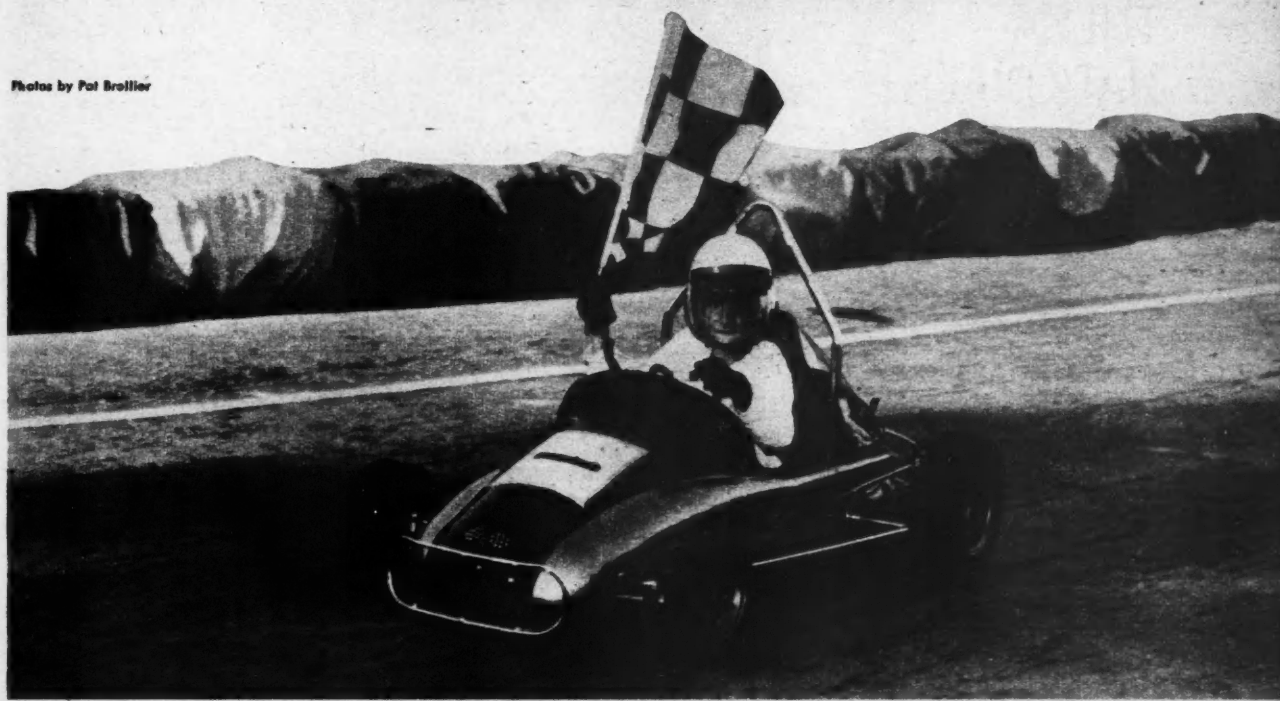
*Pint-Size Speedsters From Thirteen States
Take Checkered Flag In Southwestern
Quarter Midget Championship*

by Dick Day

Measured in keen competition—the best of facilities—and traditional southern hospitality, Oklahoma's first National Championship quarter midget races, recently held in Tulsa, chalked up another milestone in quarter midget progress. Under the auspices of the Tulsa QM Association, the three big days of action broke into a constant whine of engines as drivers from some thirteen states established new one lap qualifying records in all classes on the banked 1/20th of a mile asphalt oval. Line at the right is only a few of the nearly two hundred qualifiers, while below John Curry Jr., of Dallas, Texas, tours the track in his Viper with starter Sandy Sandborn's checkered flag after just capturing 35 lap Jr. Modified main event for National title.

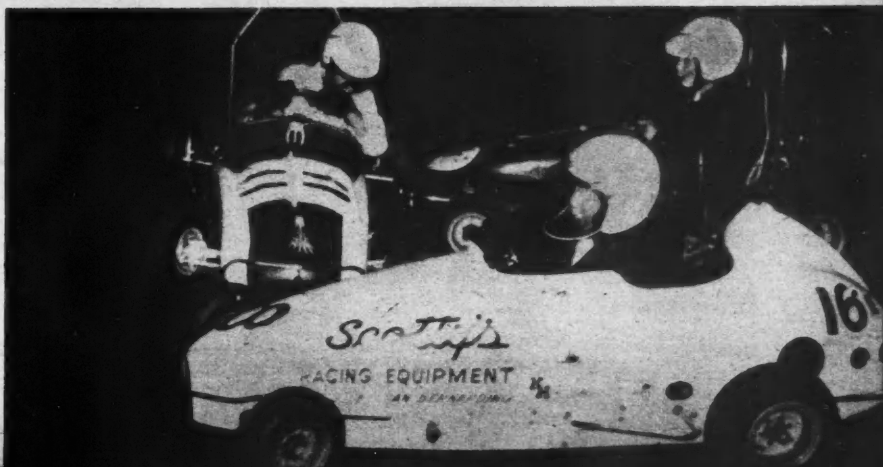


Photos by Pat Brollier



Veteran California driver, Bill Scott of San Bernardino, calls upon quick reflexes to drift his Viking-Craft roadster past entangled cars. Here, Bill was working his way up through the pack in Open Gas main—a cool head and a heavy foot in the right spots paid off with a victory for young Scotty after going the thirty-five lap distance.

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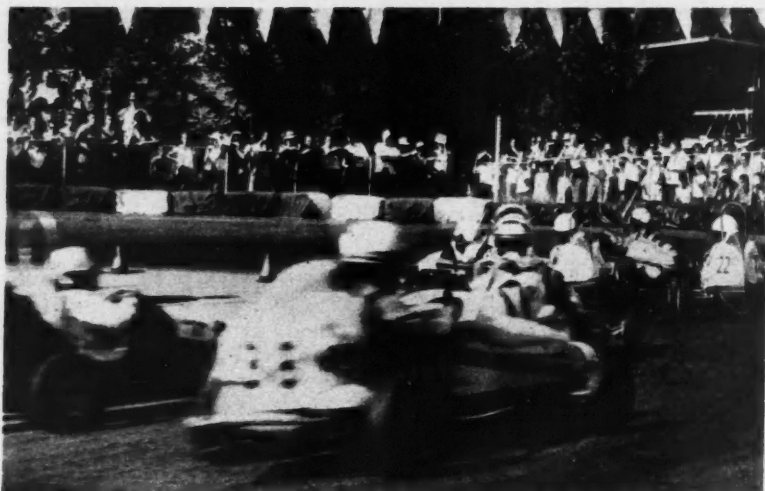




A close formation of young chauffeurs take the first corner after being given starting flag—you thing freeways are rough?

TULSA NATIONALS

As PA system barked off starting line introductions of drivers from as far away as California, Ohio and West Virginia, participants and spectators alike quickly realized the Tulsa meet held an air of national stature never before equaled in representation for quarters. 1960 calls for bigger meet.

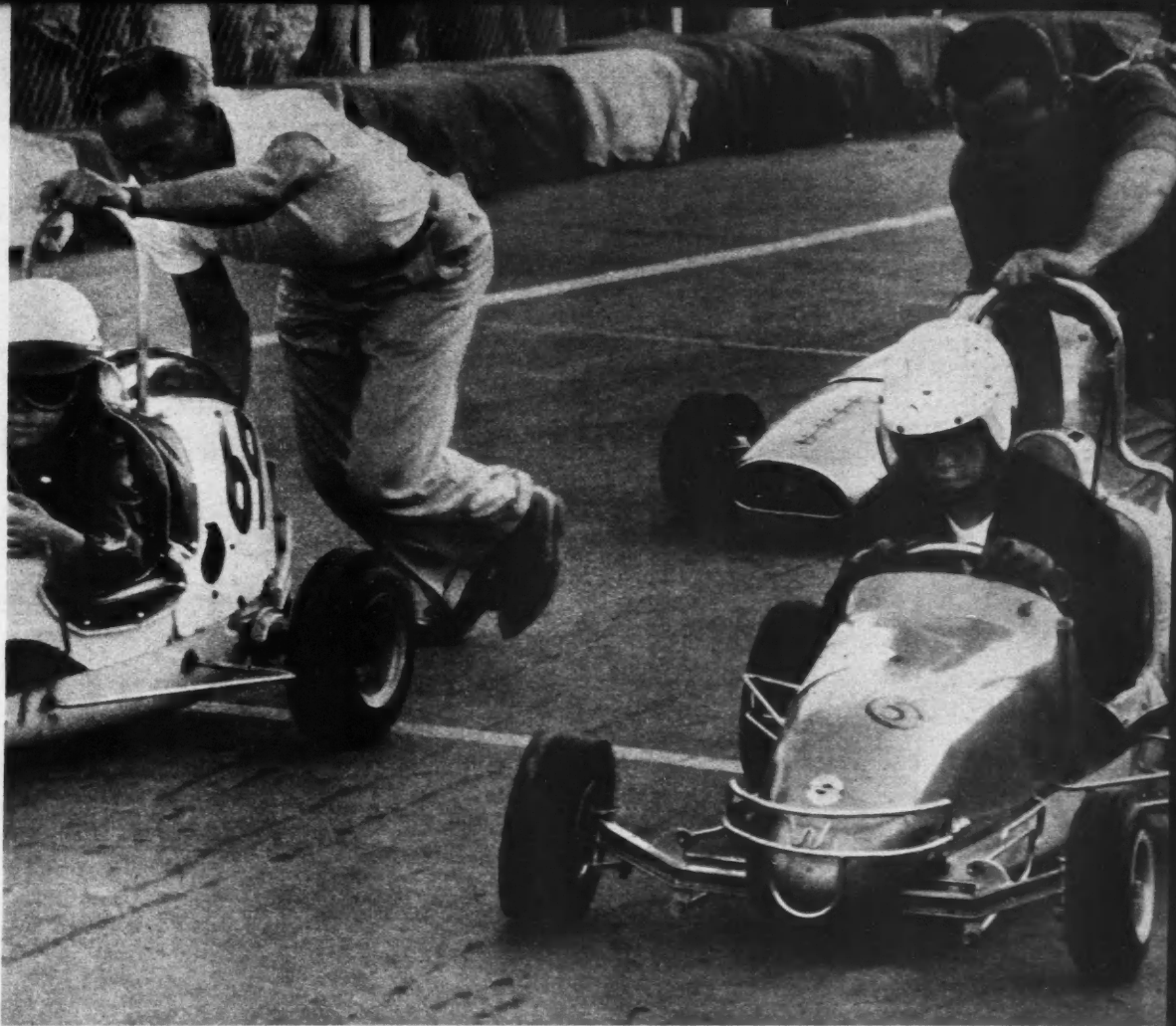


Grounds and annex pit area surrounding Tulsa race site were so spacious that many participating associations set up tent city and camped out. Combined with the races, the younger members thought this the greatest — just ask any member of this Kansas City quarter midget Group.



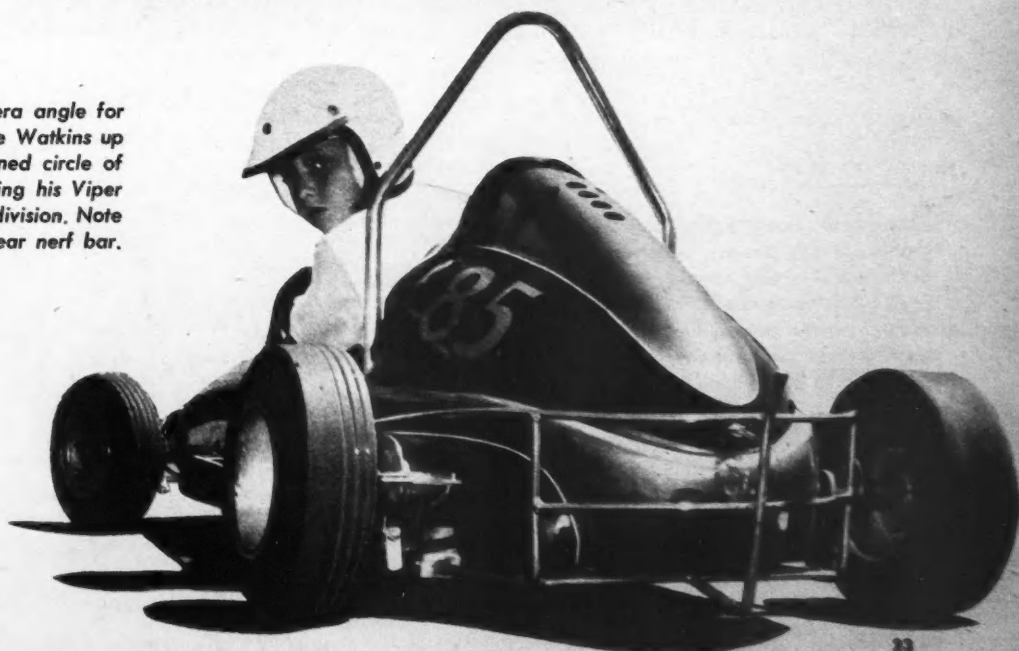
Fellow contestants swarm to congratulate twelve year old Kenny Bayer for winning senior Stock main event shortly after pulling into the pit area. Kenny, a Tulsa boy, had the home-crowd in the grandstand on their feet for the entire 35 laps as he led field wire to wire in his Viper car.





All the way from Burbank, Calif., accompanied only by his mother, young Phillip Dorsch displayed well taught mechanical skill by tuning and servicing his own Wahlborg car. His only assistance for entire race meet was CAR CRAFT push-car, editor Dick Day. Dorsch not only was fastest in senior Modified, but also won main...not bad for 14!

Striking an old pro camera angle for CAR CRAFT'S Rollei, Dave Watkins up from Garland, Texas, joined circle of national champs by piloting his Viper to victory in junior Stock division. Note the safety-type, rugged rear nerf bar.



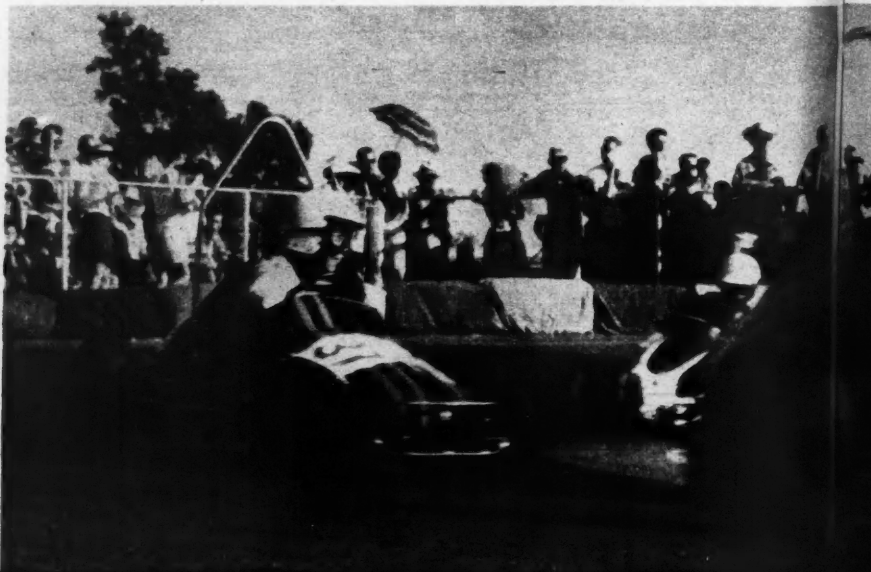
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NOVEMBER, 1959

TULSA NATIONALS

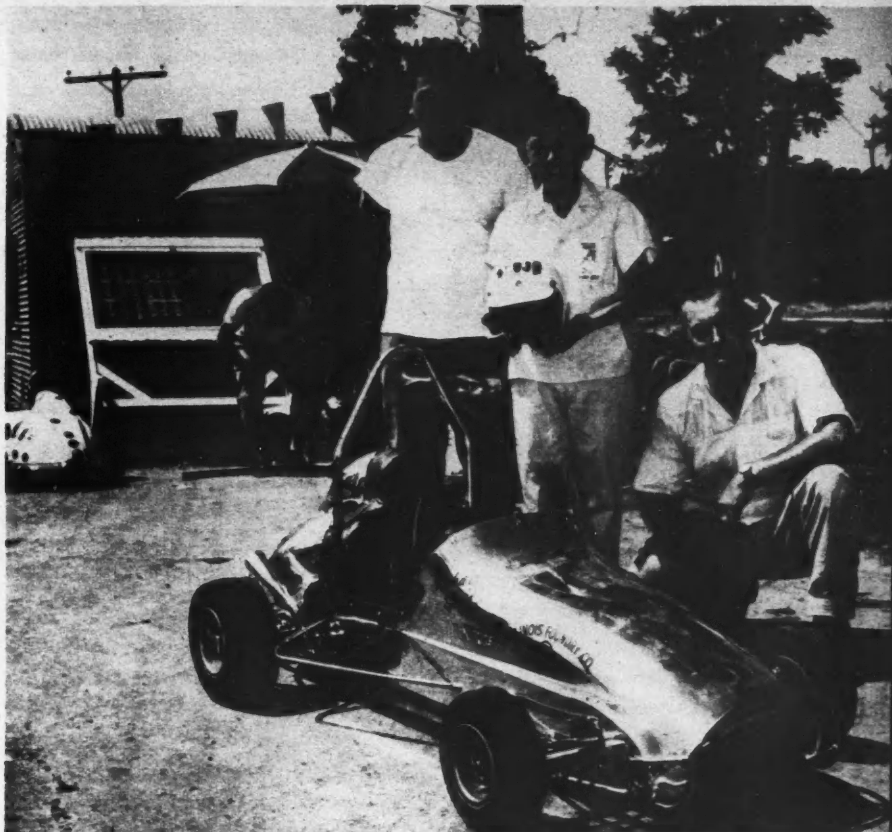


Tulsa prexy, Harry Baker, announced that plans are already underway for next year's second annual nationals. The central location and timely summer vacation dates proved ideal for east-west visitors, with many more cars promising to be on hand for '60 meet.



Hottest thing to hit the Tulsa Nationals except for meet's 100 degree weather, was Baugh/Shoji Kurtis-Craft special well cared for by pro-driver Richard Shoji (center) from Upland, California. The mirror finished all-aluminum bodied fuel car set fast time of meet and was further chauffeured to the top spot in main event by thirteen year old Shoji.

Making its debut at Tulsa meet was new Mustang Midget (left) featuring popular roadster type body and side-mounted engine. Manufactured in Covina, Calif., the sleek speedster weighs in at about 150 lbs. Unique feature of engine is complete elimination of gearbox. Drive is direct from engine shaft, transfers to jack-shaft, then to rear axle. Car soon to be on market, sells for \$500.



Participating adult members of the Dallas QM Association were found to be very stylish as well as an active group... ten gallon hats, bermuda shorts and oriental bumpershoot?



A detailed black and white photograph of a custom rod pickup truck. The image focuses on the front end, showing a large, polished chrome grille with vertical slats. The hood is dark and curved. The engine is prominently displayed, featuring a large, multi-ported carburetor and various mechanical components. A large, round headlight is visible on the right side. The front wheel has a wide, whitewall tire. The overall aesthetic is classic hot rod style.

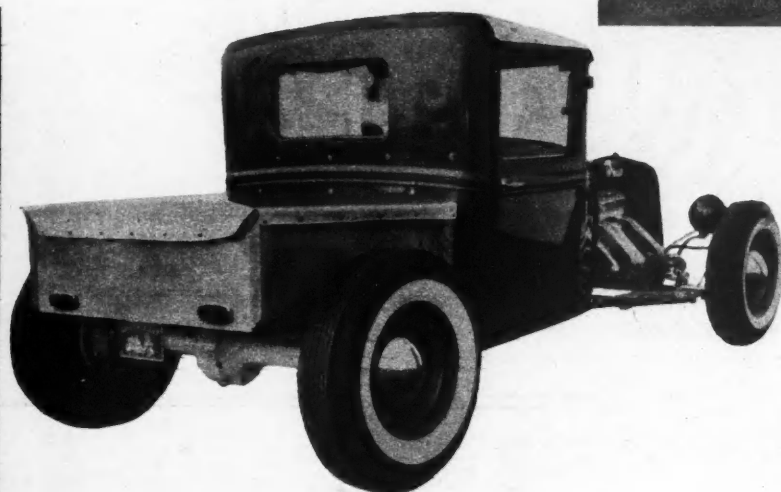
**more than
just a**

ROD-PICKUP

*It took ten stockers before
Frans Scholin settled for
this spirited twenty-nine
year old classic*



Frans Scholin of Walnut Creek, Calif., pooled all of his own resources in the construction of his '30 Ford rod-pickup. Baltic Blue is the exterior color hue.



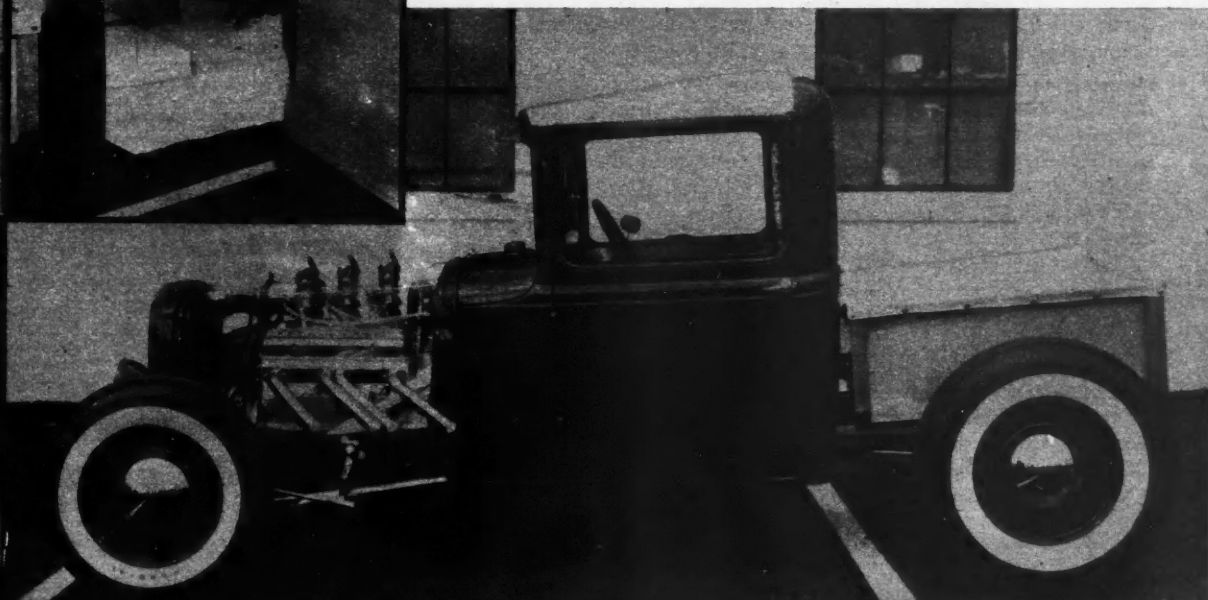
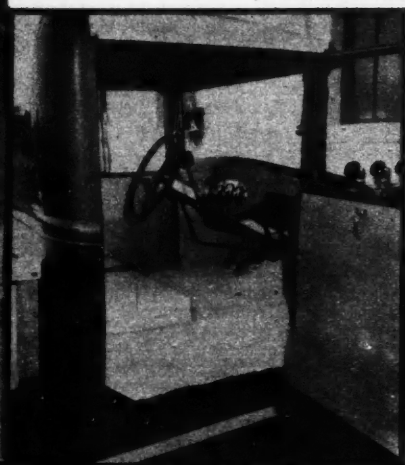
OPPOSITE PAGE • Heart of Scholin's rod is '56 Corvette mill of 265 cubic in. size with Edelbrock manifold, 3 carbs; runs through '39 Lincoln transmission.

Cab is channeled over frame 10 inches. Bed is replaced by handmade unit of birchwood; frame is '29 Ford. Wheels are reversed, small hubcaps installed.

Photos by Frank Faraone

Upholstered in birch! Door and kick panels were discarded, replaced by clear lacquered birch panels similar to bed. Dash is same, retains early Ford instrument layout. Seats rebuilt, covered with white Naugahyde by Scholin.

Running gear on '29 Ford frame is a dropped Ford 'A' axle, '37 Ford steering spindles with '29 gear. Ford 50-50 shocks are mounted all around; brakes are '40 Ford hydraulics. Pickup took two years worth of work in construction.



RACING BLOWERS Part II

DRIVE KITS

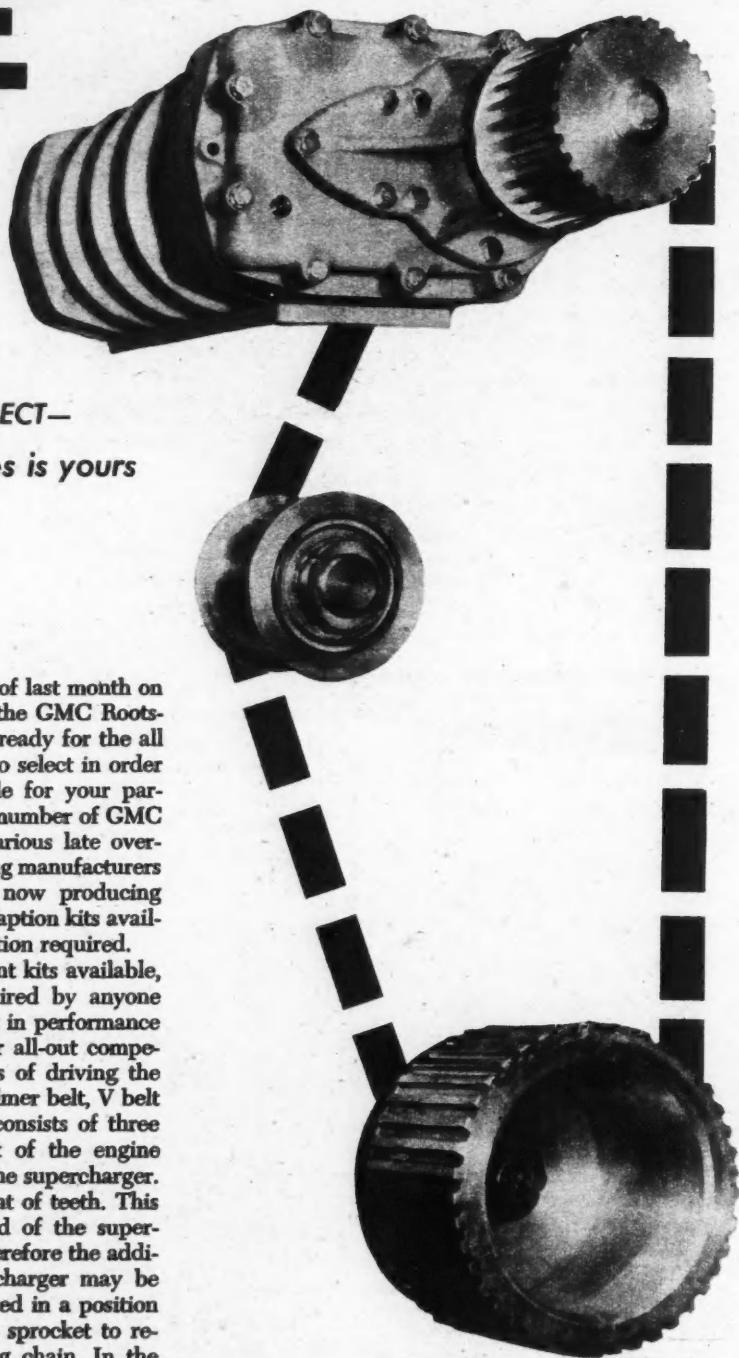
V-BELTS, CHAIN, GILMER, DIRECT—

The choice of blower drives is yours but first know the pros and cons of each design

By John Geraghty

AFTER READING the initial article of last month on the maintenance and assembly of the GMC Roots-type supercharger you should now be ready for the all important choice of which type drive to select in order to derive the greatest benefits possible for your particular needs. With the ever increasing number of GMC superchargers being adapted to the various late overhead valve engines, several of our leading manufacturers of automobile racing equipment are now producing suitable, relatively inexpensive drive adaption kits available for each and every type of installation required.

We have selected the most prominent kits available, covering all the drive adaptations required by anyone desiring either a small amount of boost in performance or the extreme pressures demanded for all-out competition. There are four popular methods of driving the Roots-type superchargers, the chain, Gilmer belt, V belt and direct drive. The chain drive kit consists of three sprockets, one is placed on the front of the engine crankshaft and another on the nose of the supercharger. These sprockets vary in size and amount of teeth. This difference in size determines the speed of the supercharger in relation to the engine and therefore the additional pressure supplied by the supercharger may be controlled. The third sprocket is mounted in a position that will enable the adjustment of this sprocket to remove the excess slack from the driving chain. In the chain drive kits where the third pulley is not furnished, a serious problem may be encountered, this is a cen-



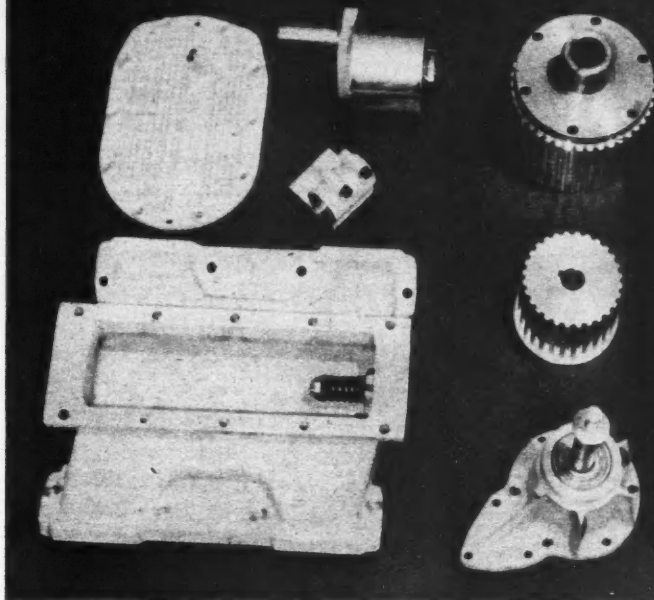
trifugal weight problem which exists in some degree with every chain coupling. The constant rapid acceleration of the drive assembly when in use tends to throw the chain outward opposite the driven side. This increases the weight of the chain to the point of, in many cases, tearing keyways out of sprockets and destroying the complete drive assembly.

The V belt type drive is adaptable to almost any need. This unit can incorporate any desired amount of belts depending on the amount of pressure intended for the supercharger to produce. The pulley arrangement is very similar to the chain drive with one exception. The third pulley, often referred to as an idler, must be very well anchored and built to withstand a great amount of pressure. This is extremely necessary when multiple belts are used. A V belt tends to stretch on the driven side and therefore if an idler pulley is loose the belt will gain slack and actually jump off of the pulleys.

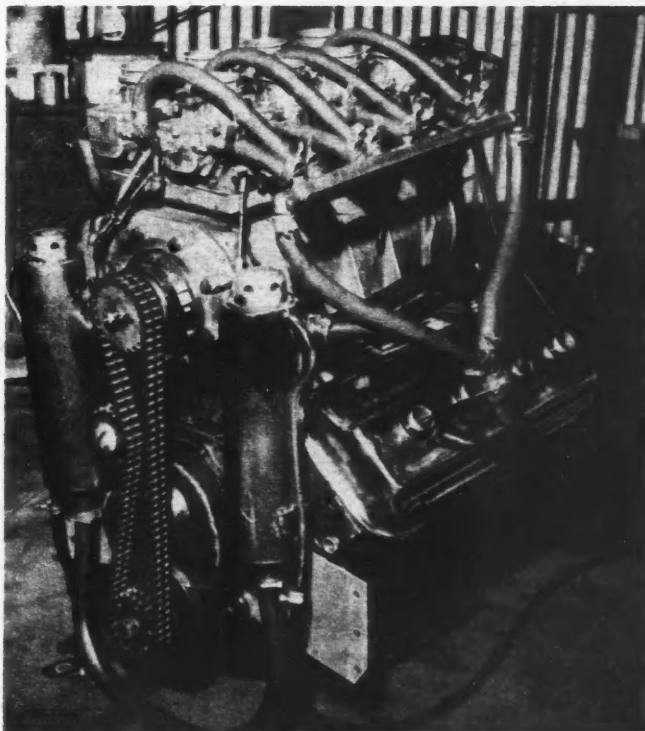
The direct drive is constructed in a method that will prevent any slippage of the coupling unit while in use. While this might sound advantageous it has one major shortcoming. The Roots-type supercharger being a positive type will, under a condition such as firing with the intake valve open or coughing back, will tend to stop the rotation of the blower and reverse itself. The action is partially relieved by a safety valve called the "pop off", but in some cases this valve is not ample and the internal pressure will tend to explode the supercharger or manifold. With a positive connection between the crank and the supercharger this could be a problem and becomes dangerous as well as expensive.

CRAGAR TRIPLE V BELT DRIVE

The first drive adaption that we shall discuss will be the triple V belt kit produced by Cragar Manufacturing Co. This is a very satisfactory, inexpensive way of adapting the GMC supercharger. The Cragar kit is designed to drive a blower producing a boost pressure of preferably five to seven pounds, therefore this unit is best suited to the local drag enthusiast who intends to not only use his car for competition but also transportation. This unit may be installed without any internal engine modifications and therefore makes it one of the best selling kits



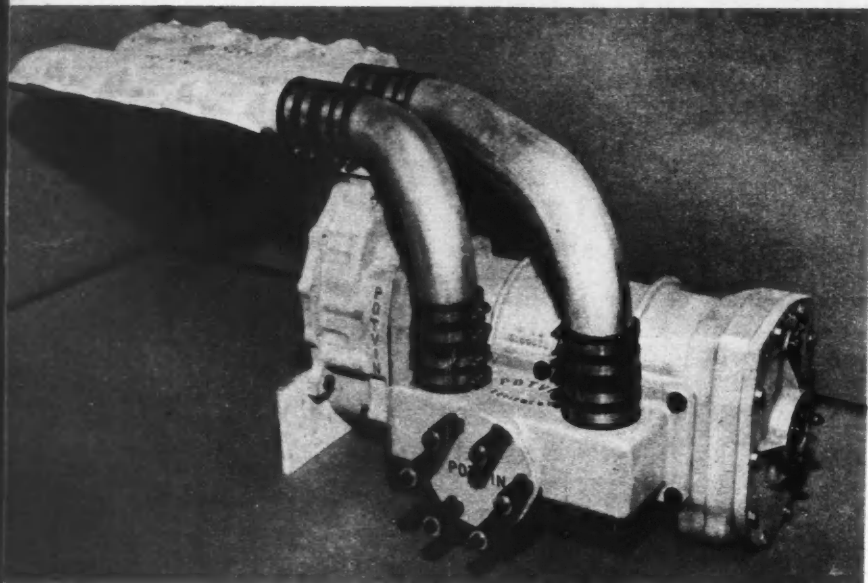
The Gilmer drive kit manufactured by Tom Beatty Automotive may be purchased with or without supercharger, which has lower flanges removed and clearances set. Kit for 4-71 is \$425, 6-71 \$400. 4-71 blower costs \$275, the 6-71 lists \$175.



The chain drive units necessitate the use of an idler gear sprocket to prevent the chain from whipping around during rapid changing of the RPM range.

CONTINUED

RACING BLOWERS



Potvin crank driven unit may be obtained complete with blower and set for racing or in kit form only. The 6-71 kit for Olds and Chrysler is \$296.70, with blower \$565.70. For Chevy the 4-71 kit is \$323, \$640.70 with the blower.

on the market. In cases that demand more boost pressure than the recommended 7 pounds another 2-3 pounds is possible although there will be a constant belt problem. Although V type belts are the best suited for this particular conversion they will stretch under extreme load conditions and tend to slip and hop off when limited in number.

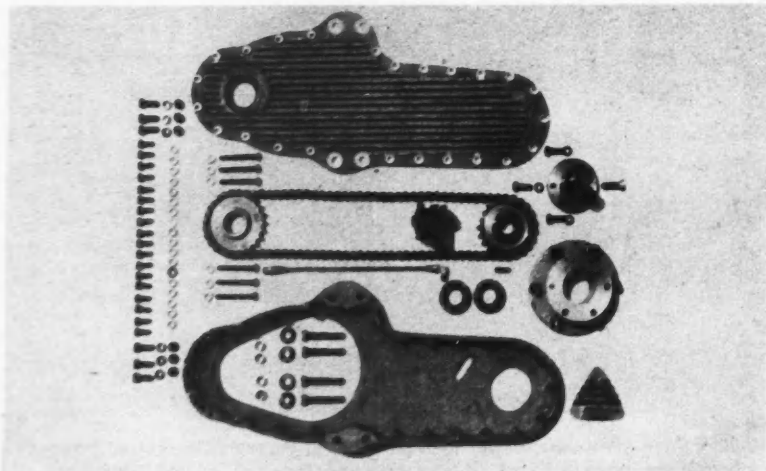
HOWARD CHAIN DRIVE

Howard Johansen manufacturer of the famed Howard Racing Cams produces one of the most popular

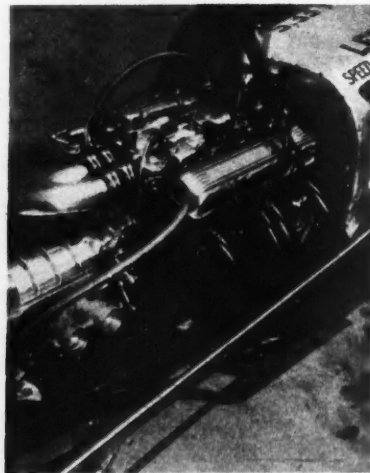
chain drive kits available. One of the outstanding features of this unit is a husky guard shield that houses the complete drive kit to protect the driver or chassis from damage occurring in the case of a broken chain. The chain drive kit, although reasonable in cost, will produce the same results as the most expensive drives available but having a positive connection between the engine crankshaft and supercharger this unit automatically inherits the undesirable feature common with direct drives.

POTVIN CRANK DRIVE

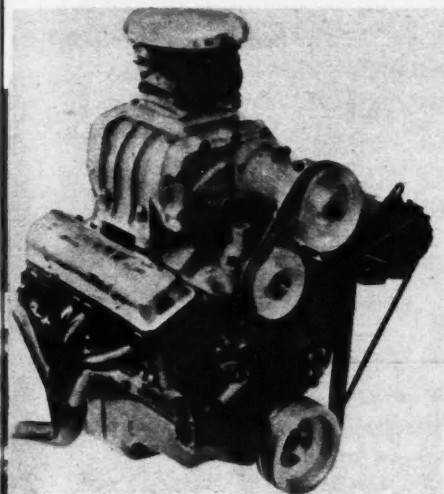
The Potvin drive kit is one of the first units made available to the average hot rodders pocketbook. This adaption kit has been constantly improved since first introduced. This unit is referred to as a crank drive adaption because of the direct attachment to the front of the engine. A small quick-change type gear cage is available with this kit which allows the supercharger to be driven at any desired ratio. The Potvin drive was originated for use in competi-



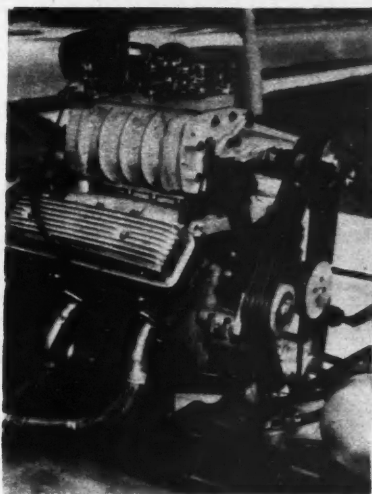
Howard chain drive kit at the present time is available only for the Chevrolet and Chrysler engines. Kit includes the necessary idler gear. Price for the kit is \$250.



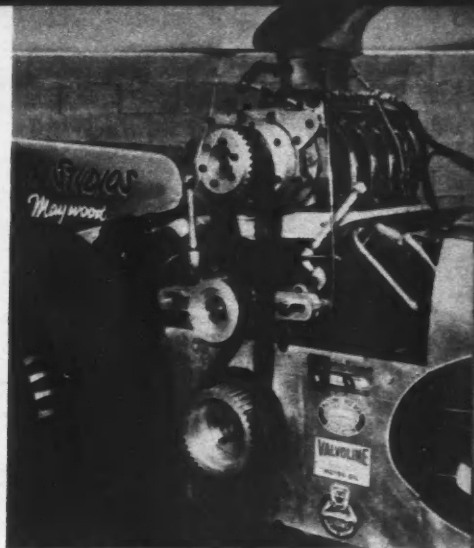
Potvin crank drive assembly delivers fuel via lines to aluminum manifold.



The Cragar triple V-belt drive kit is excellent for the owner who drives in some competition yet uses car on street.



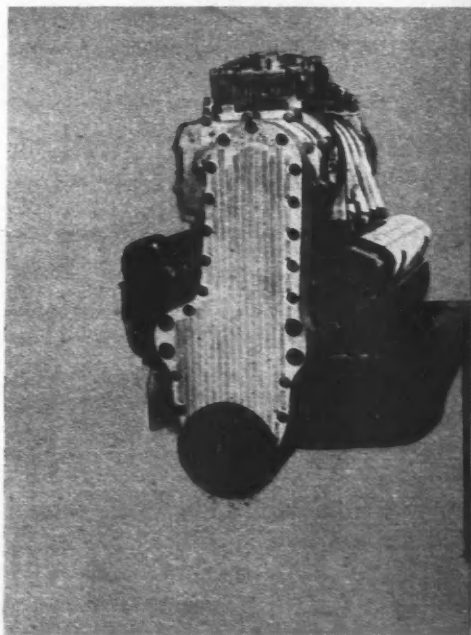
Multiple V-belt drives are designed to produce any amount of boost pressure desired, will allow slippage on misfire.



Gilmer drive has one neoprene steel impregnated flat belt with raised areas which interlock with the two pulleys.

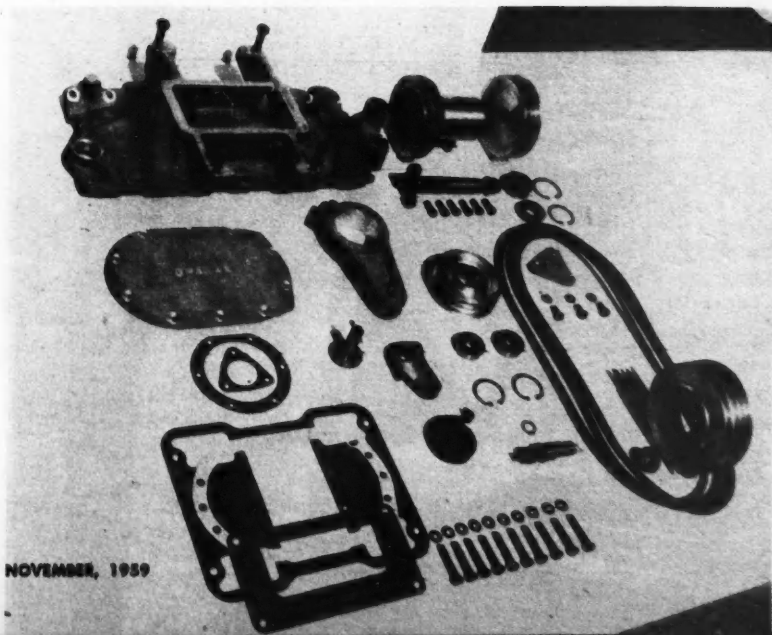
tion cars such as streamliners and sleek drag racing machines which employ a low hood silhouette. This kit is best applied to the all out competition machines and should be used in conjunction with a low pressure boost, preferably below ten pounds, with a percentage of nitromethane. The reason being, a high boost pressure traveling through the blower ducts creates a heat factor which in turn expands the incoming charge thus reducing the possible volumetric efficiency of the engine.

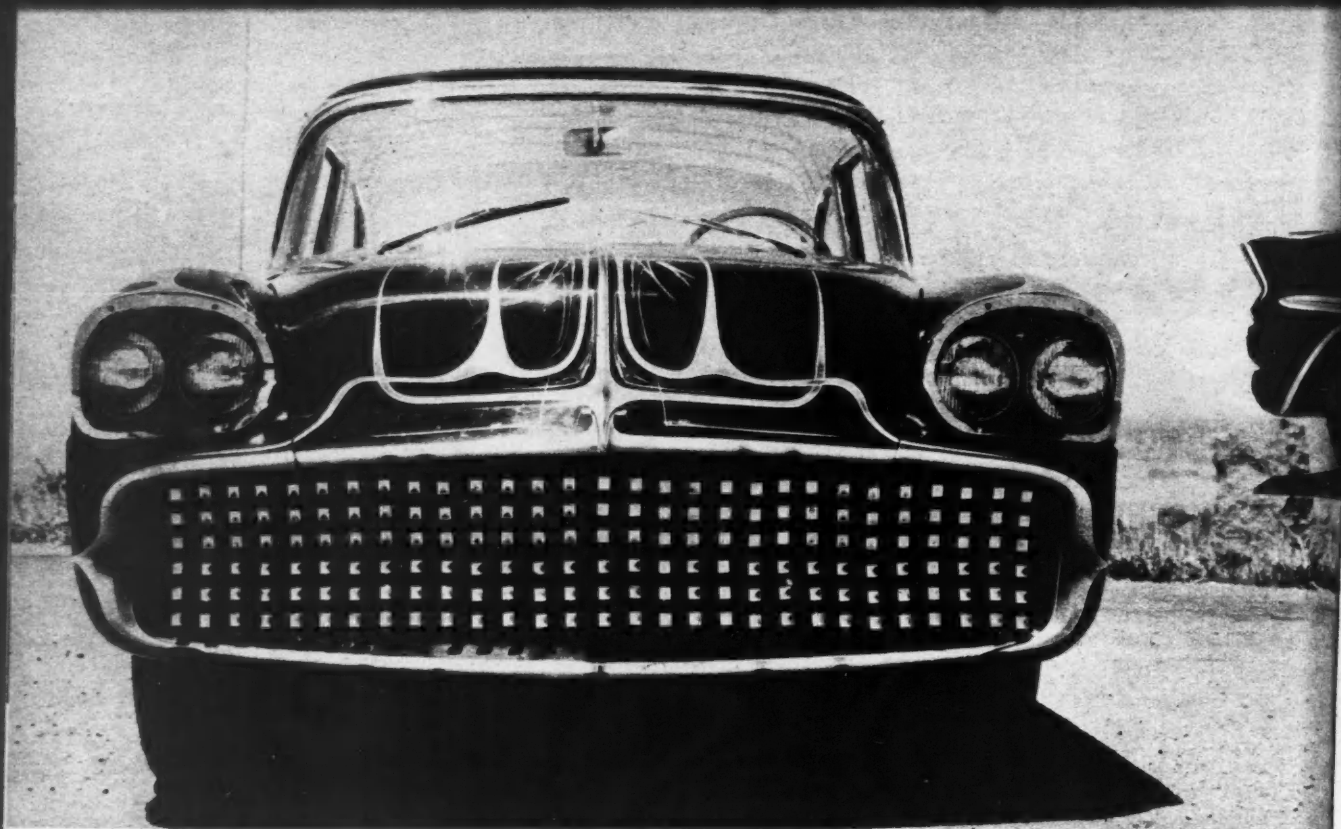
This may be partially cured by injecting the fuel directly into the intake ports and cooling the compressed air somewhat by injecting a small amount of alcohol or water directly into the inlet side of the supercharger. With these facts in mind we recommend this adaption for the following use; a fuel burning competition machine running approximately 8-1 compression, 7 pounds boost pressure and a maximum of 50% nitromethane to be a good combination.



Howard chain drive kit has the advantage of being completely enclosed in a beefy aluminum shroud, a good safety measure should chain happen to break.

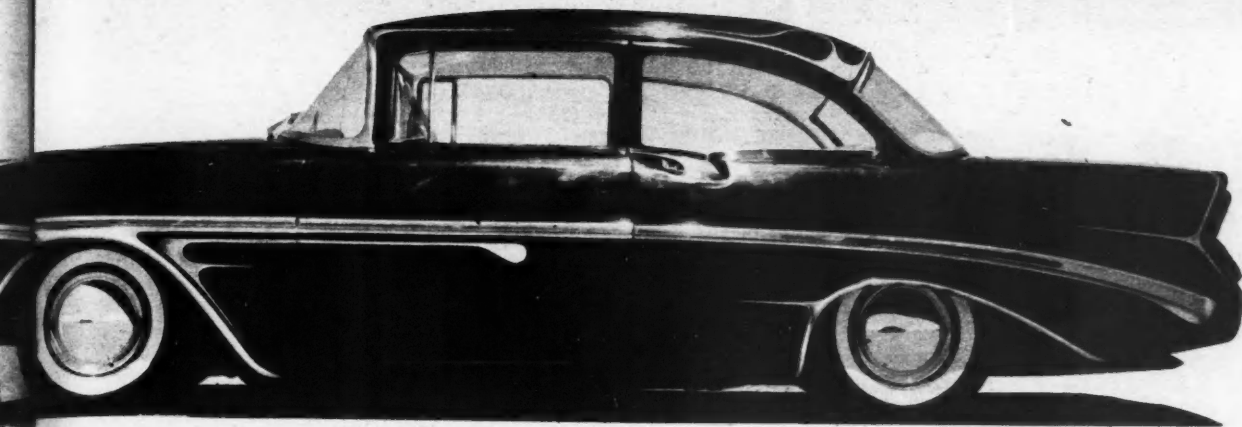
Cragar triple V-belt kits are available for most late OHV engines and sell for \$265 less supercharger. The Chev kit is slightly higher. Cragar also makes a Gilmer drive which sells for \$345.





PORTLAND PACESETTER





Photos by Pete Sukolac

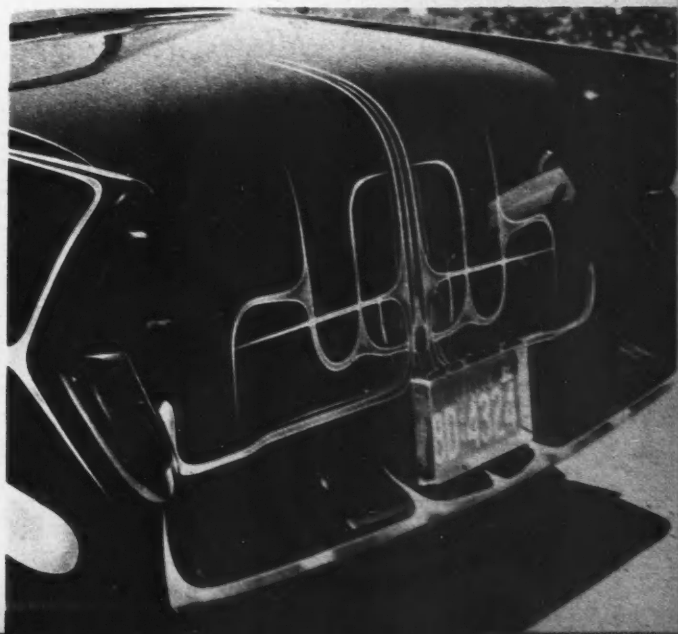
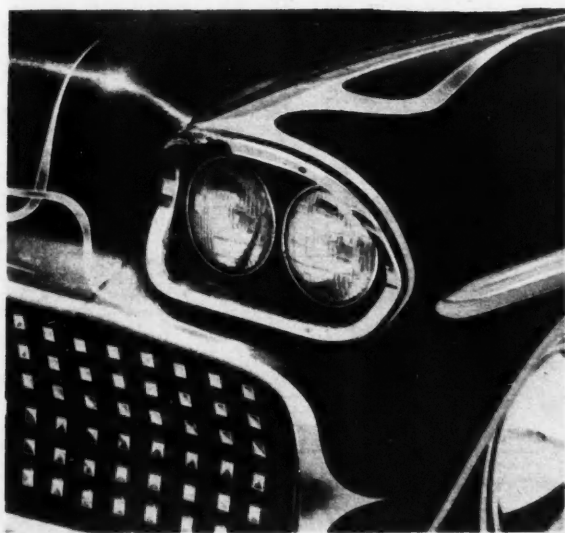
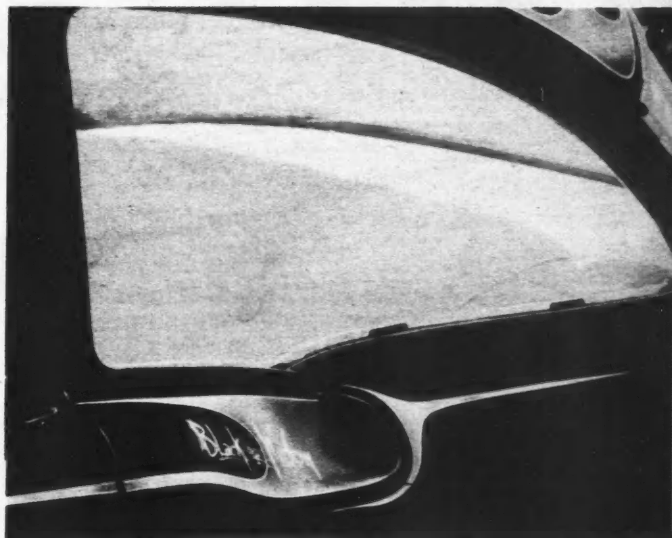
LeRoy Robinson of Portland, Oregon took his '56 Chev to Bill Cahill of Gordie's Custom Shop for designing and custom work. Black lacquered, it is lowered via A arms, blocks.

Impressive front end features a '58 Buick checkered grille assembly which is housed within two '53 Studebaker grille pans molded-in. Assembly will 'flex' if bumped accidentally.

Decorative scallops of five blended colors lead to functional air scoop duct cut into the rear fenders. Door and trunk handles, along with some trim, removed; operated by solenoids.

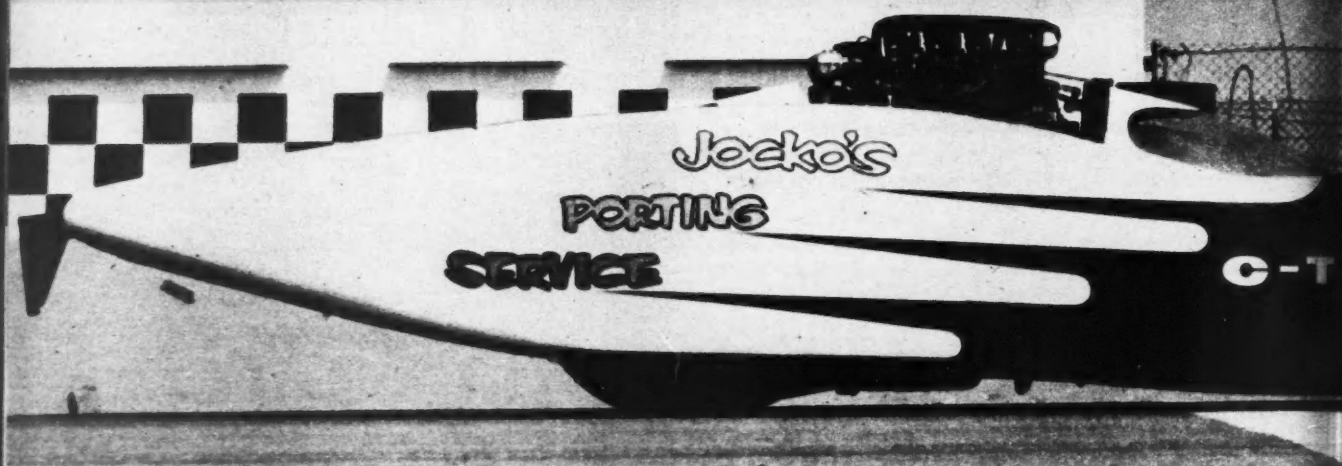
Interior is upholstered in pleated and rolled white Naugahyde. Harmonizing rugs add to appearance. Headlights, below, are Chrysler quads fitted to extended fenders.

Taillights are four '56 Buick lenses installed in extended fenders; opening is frenched with round rod. Bumper discarded, rear features molded '53 Studebaker grille pan.



SIDE INTERNATIONAL MOTORACEWAY

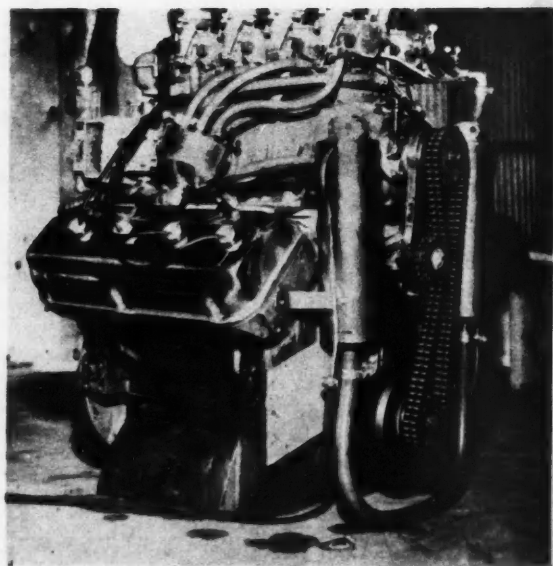
DE INTERNATIONAL MOTOR RACEWAY

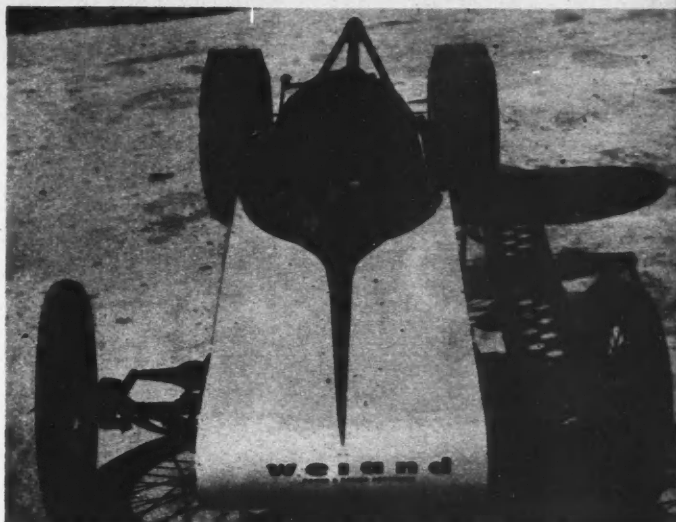


STREAMLINED

*First of the full
streamlined dragsters—
450 hp Chrysler combined
with sleek shell
blasts quarter in 8.35 e.t.*

'57 Chrysler mill displacing 450 cubic inches is given added go via GMC 6-71 supercharger with eight floatless '48' carbs on Weiland manifold. Bore is 4 inches, stroked with C&T kit to 4½ inches. Herbert cam, push rods, and lifters are used as are Forgedtrue pistons, Schiefer 11 inch clutch.





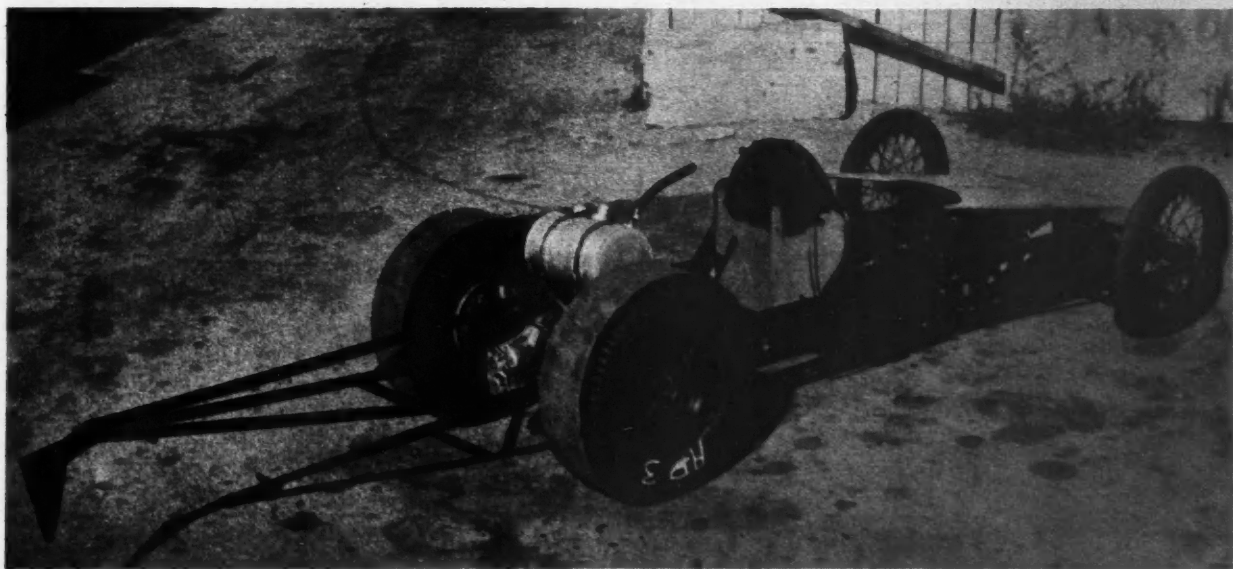
Beneath streamlined racing shell of Bob 'Jocko' Johnson's swift dragster is this frame of 1 1/2" tubing. Long Beach, Calif. is home of this draggin' wagon. Sheet metal is brace.

Body is of fiberglass construction; vibration and shock on a high speed run caused demolition of body shortly after photos were taken. Similar aluminum shell is now being built.

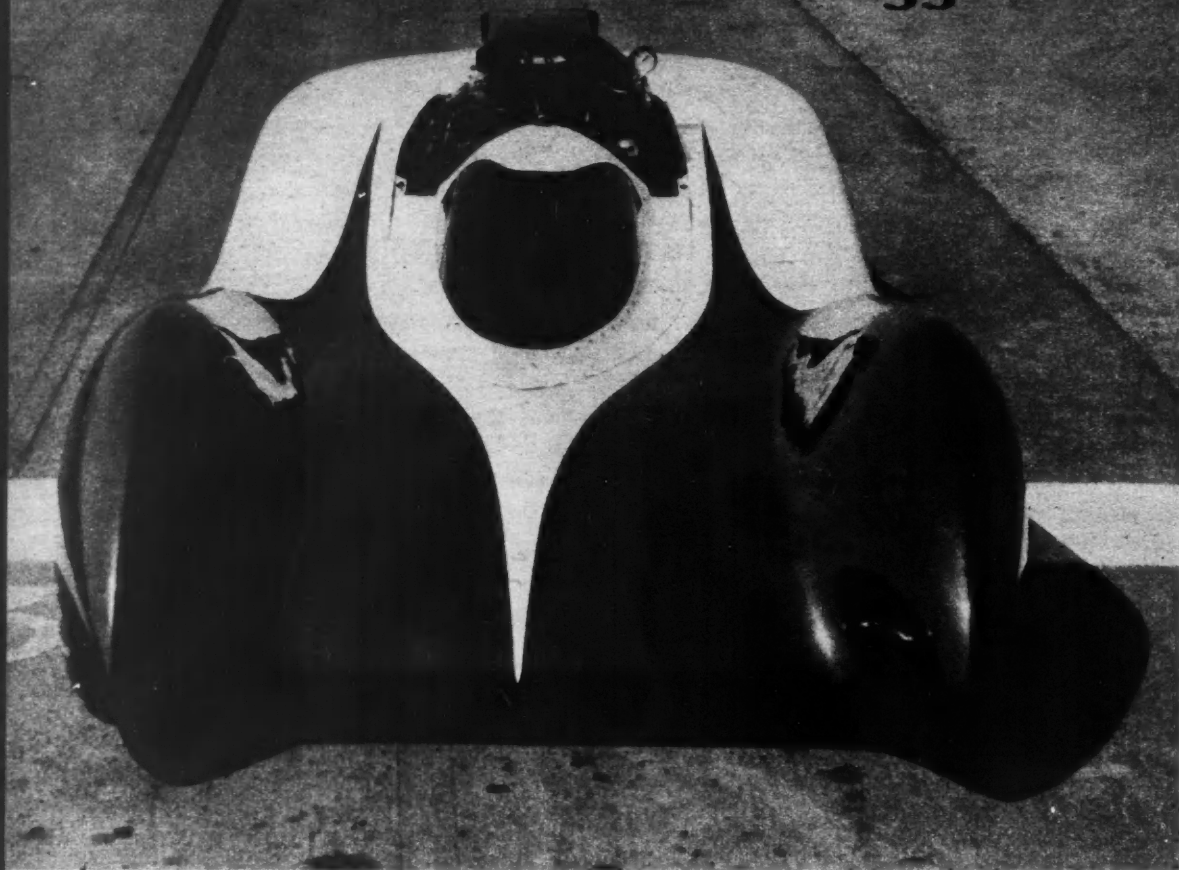
Bare chassis sans engine illustrates rugged frame. Wheel-base is 99 inches, while tread in front is 60 inches, narrows to 40 inches in the rear. Chrome Moly is used; note push-tail.

For Draggin'

Photos by Bud Lang

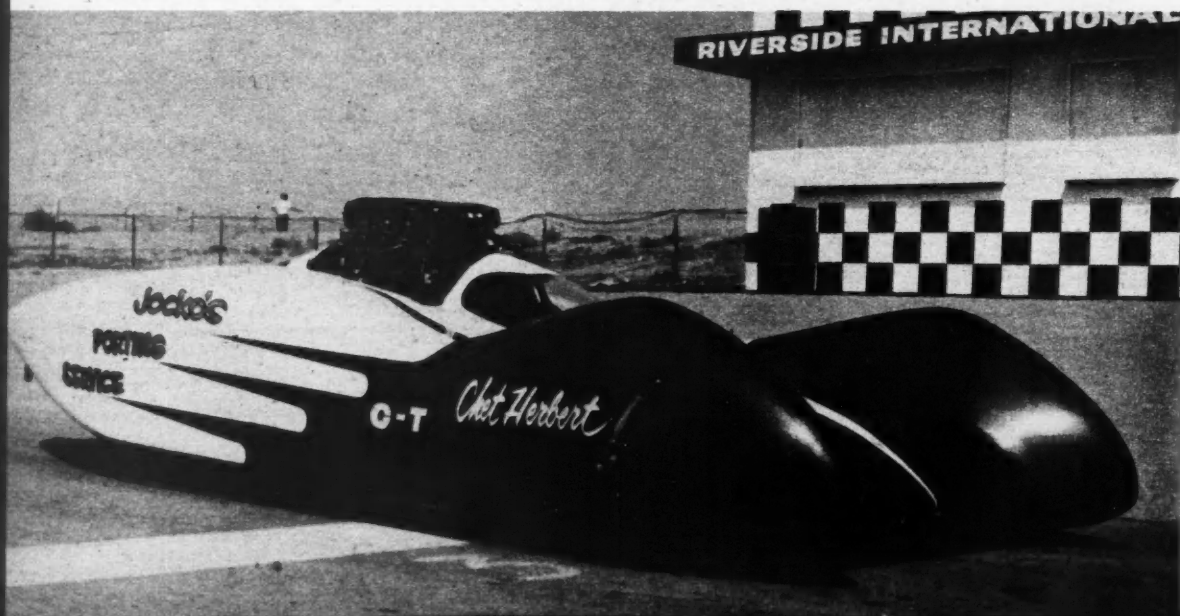


STREAMLINED For Draggin'

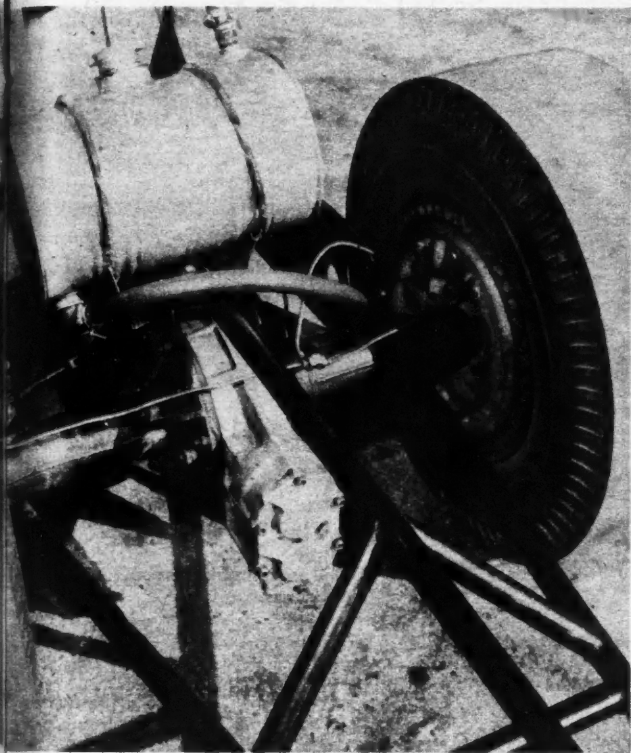


Engine protrudes through surface of streamlined body. Car is only dragster which runs Bonneville-type shell. Top speed for Jocko's speedster is 178 mph, while fastest e.t. is clocked at 8.35. 'Jazzy' Jim Nelson is the regular driver.

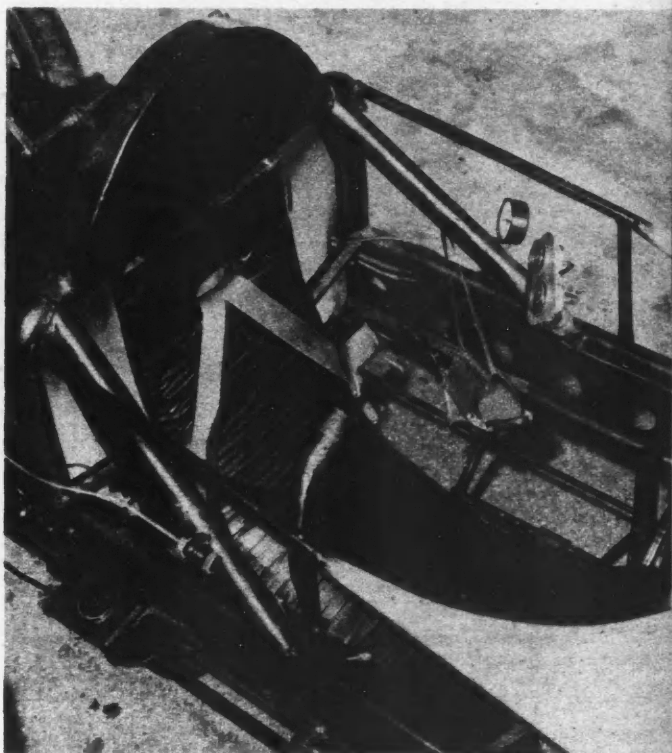
Full impact of streamliner's exterior hues can be found on the cover. Tube chassis' running gear includes homemade friction shocks up front with none at rear, '40 Ford steering gear and spindles, and '58 Buick brakes mounted in rear.

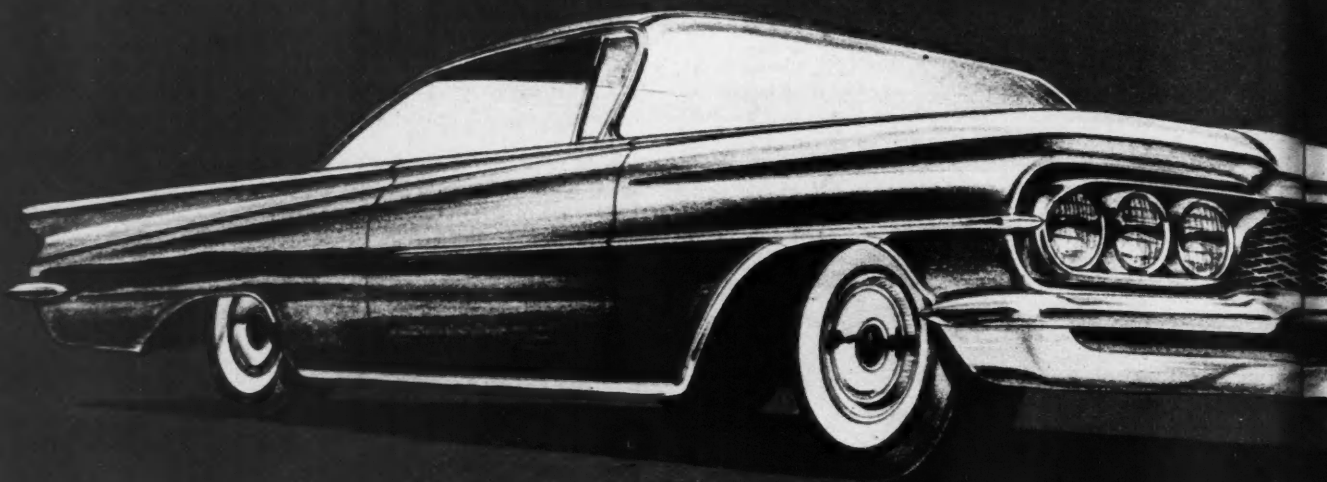


Chassis tapers to rear a total of 20 inches compared to the front tread specs. Quick change rear end is of Halibrand manufacture. Axle is '46 Ford unit; small gas tank is used.



Nelson sits secure and safe in snug cockpit. Low silhouette of streamliner body demands low seating arrangements as provided by curved seat. Brake lever, left, is in easy reach.





VALLEY CUSTOM RESTYLES THE '59 OLDSMOBILE

MANY RESTYLERS, in search of a different automobile to customize, are turning to the '59 Oldsmobile. To some, it is out of reach due to the high initial purchase price. Nevertheless, it possesses many interesting contours and body lines which can be tastefully revamped with a little thought.

To illustrate this, we asked Neil Emory and Clay Jensen of Valley Custom Shop in Burbank, California to give us their interpretation of a customized '59 Olds. The only restriction was that they remain within \$1000 in their customizing budget.

BODY MODIFICATIONS

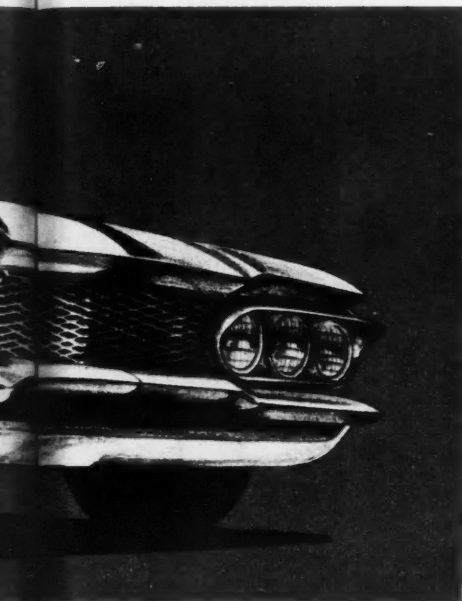
First item to be changed was the excessive chrome trim and name medallions found on the car. These were all removed and the holes filled. Once again, the door handles are removed and an electric solenoid system is installed in their place. This is the only 'optional' item on the car that is not included in the price list as many customizers prefer to leave the door handles intact.

FRONTAL CHANGES

An extremely simple method of cleaning-up the front end is to re-

move the bumper guards which are installed just beneath the headlight units. This lends a flowing straight line to the bumper and the actual work involved costs not a cent.

On the stock headlight set-up, there is a small parking light or turn indicator placed between the dual light units. Valley Custom decided to remove this and fill the space by adding another full-sized lamp unit which gives us six headlights up front. This could possibly be the start of a new trend. Around the headlight assembly is a metal hood with a protruding lip at the top. The entire

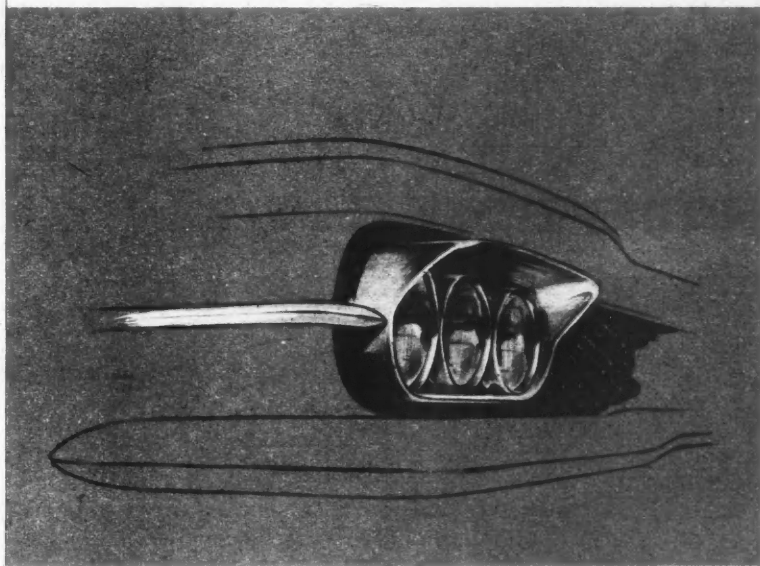


headlight assembly is placed upon an expanded metal screen which replaces the stock grille. The remainder of the front end is stock.

REAR ASPECT

To match the headlight hood treatment, the taillights on the rear have been modified to correspond. They feature a slight lip which is extended above the stock taillight lens.

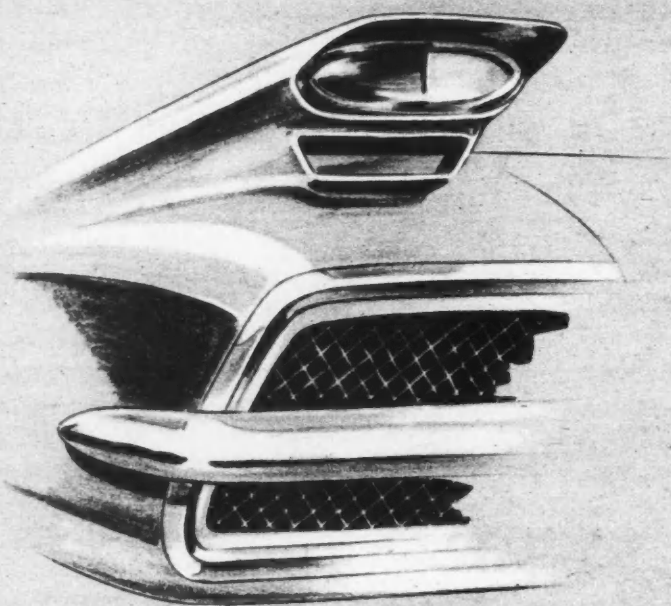
Neil and Clay felt that the rear end was too cluttered and jumbled. To retain the smooth flowing lines found on the remainder of the car, they changed it in this way: first, they discarded the stock rear bumper. To replace it is a stock front Olds unit. This was chosen because it would carry the same basic design theme of the front to the rear. The metal section just above the bumper is removed. Since the bumper is off, there is an equal section of metal area beneath the original bumper



Clay Jensen



Neil Emory



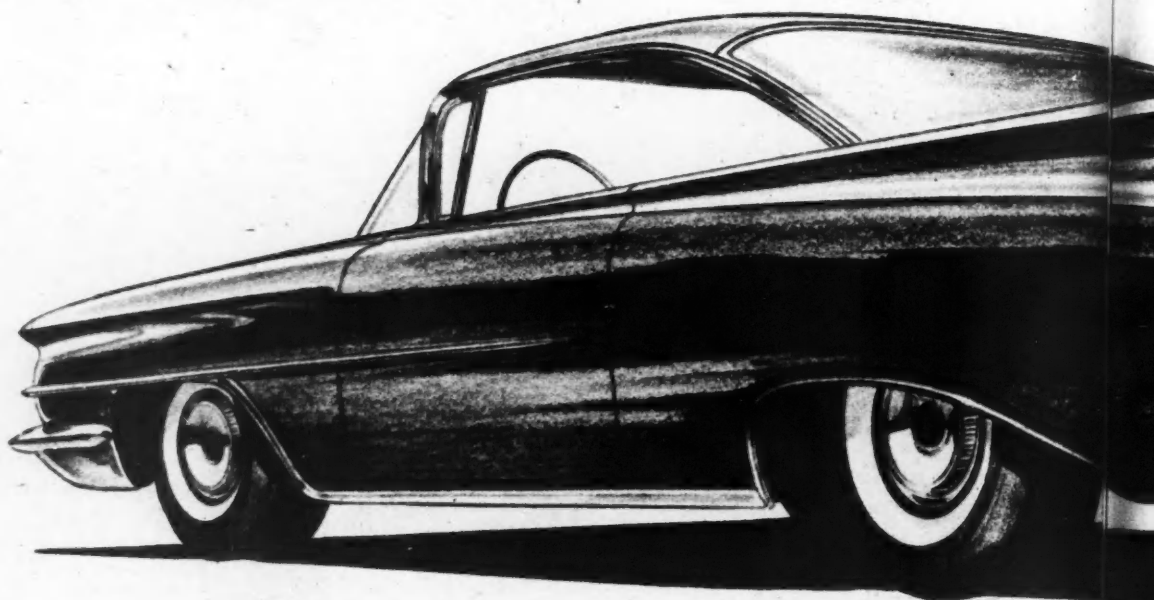
placement. The lower tips of the fenders are chopped off and the pan is rolled under for a smooth appearance. Then, the two areas of open space are filled with expanded metal screen similar to the front grille. The stock rear chrome trim lip which is just above the bumper is retained, but a lower piece is added to frame the rear end grille. Then, the bumper is added to separate the two areas.

DETAILS

Neil and Clay say that the Olds should be two-toned in Copper and black lacquer: Copper top and body seam from doors over trunk, black body. A fitting exterior color scheme for their Oldsmobile restyle.

RESTYLING

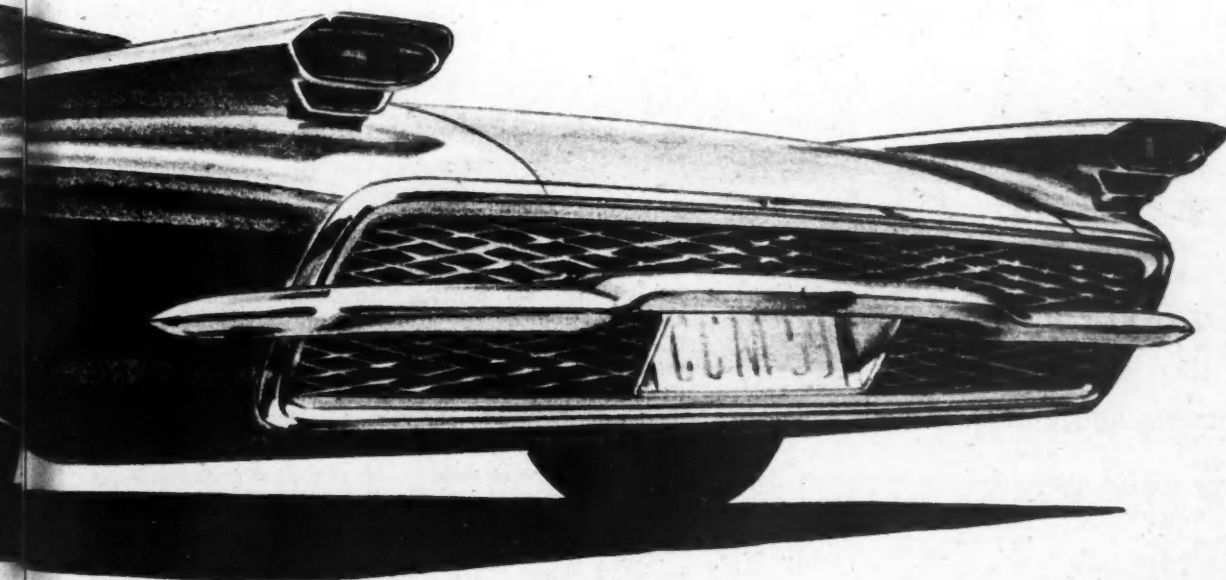
THE '59 OLDSMOBILE

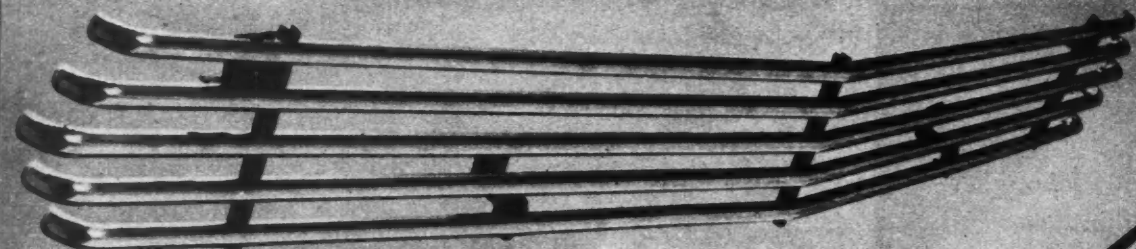


PRICE LIST

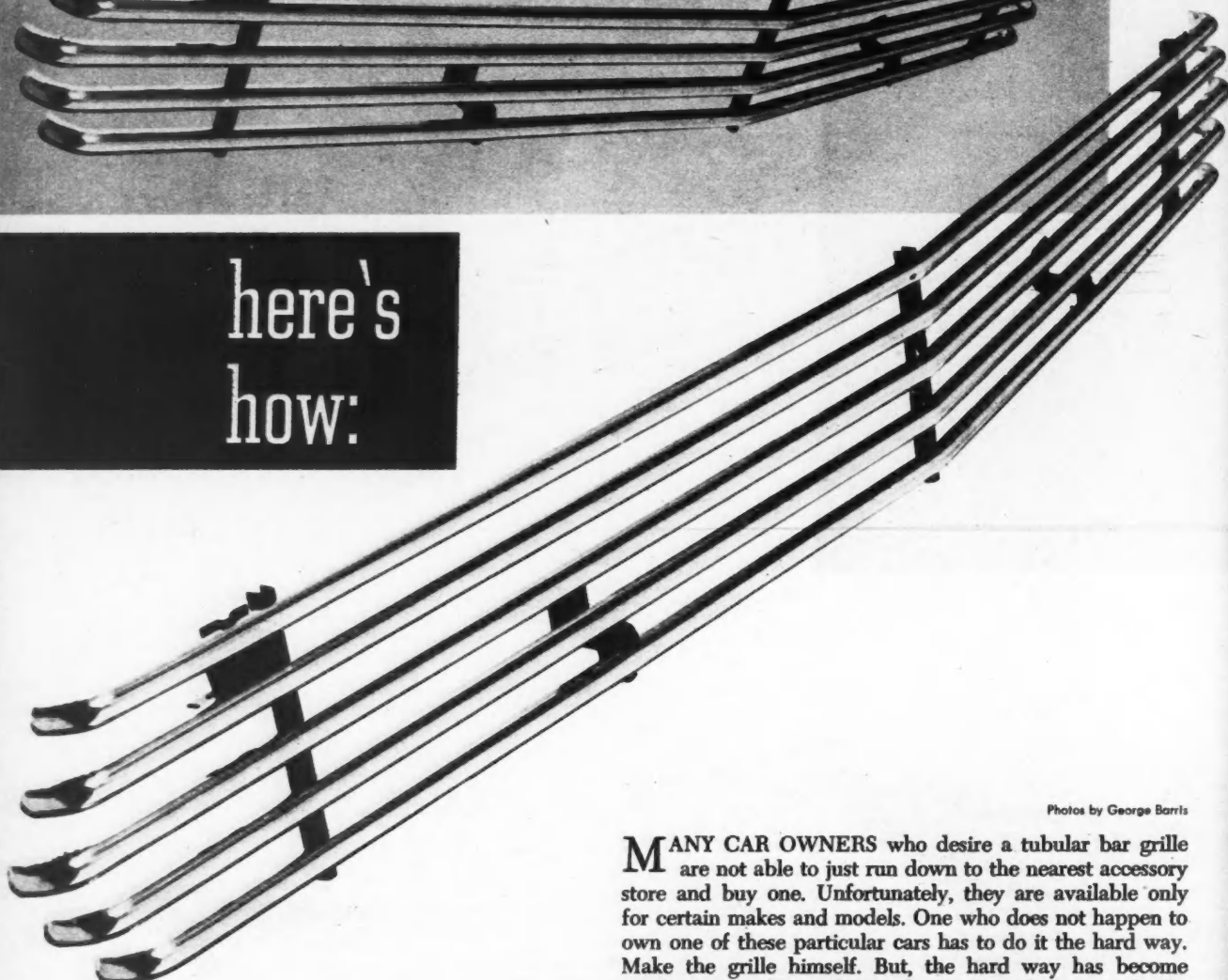
Letter and Parts
included

Remove front fender ornaments	\$ 10.00
Remove hood ornaments	10.00
Remove front medallions	20.00
Install headlight unit, construct hood	125.00
Install mesh screen grille	50.00
Construct, install taillight hood	115.00
Install front bumper on rear	100.00
Roll rear pan	200.00
Install lower trim on rear	25.00
Install mesh screen grille in rear	100.00
Two tone paint, lacquer	200.00
TO AL	\$960.00





here's
how:

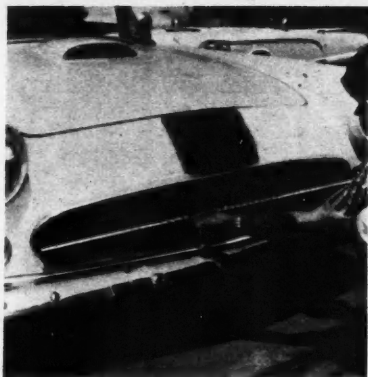


Photos by George Barris

TUBE BAR TRICK

*Custom adaption for
any grille opening*

MANY CAR OWNERS who desire a tubular bar grille are not able to just run down to the nearest accessory store and buy one. Unfortunately, they are available only for certain makes and models. One who does not happen to own one of these particular cars has to do it the hard way. Make the grille himself. But, the hard way has become much simpler. He no longer has to start from scratch. He can use an accessory bar grille now on the market, modifying it to fit in his own car. This grille is the one made for the '58 Chevrolet. The grille opening of the '58 Chevy is one of the widest there is, making it possible to trim the grille to fit most any opening be it stock or custom. Also, the accessory grille contains five bars, which means it will fill out the vertical height of most any opening. The following step-by-step photos indicate that the job is not too entailed and can be done in a short time. A point to remember when making the modification is that after removing the desired amount from the bars to fit the grille cavity, when joined back together, the joint must be centered in the cavity. The grilles are available at most accessory stores, mail order houses, or at California Custom, 1807 West 65th St., Los Angeles 47, Calif.



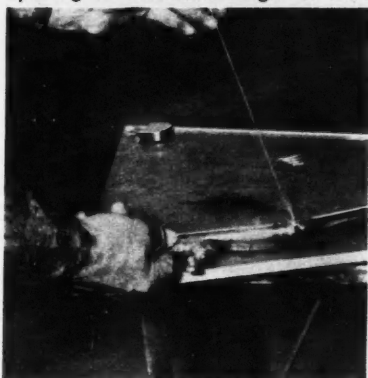
1. Measure the horizontal length of the opening to determine length of bars.



2. Place each bar in position to find center point, mark amount to be trimmed.



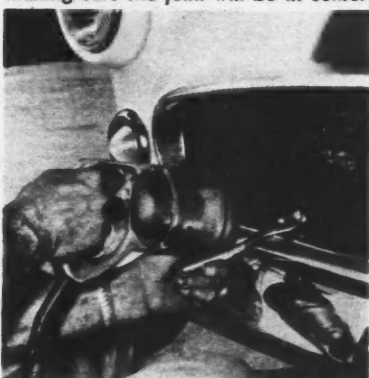
3. Cut desired amount from each bar, making sure the joint will be in center.



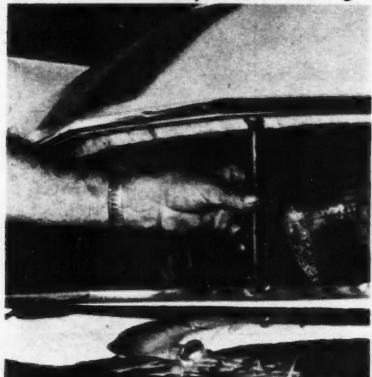
4. Braze bars together. Grille can be formed in a V shape or left straight.



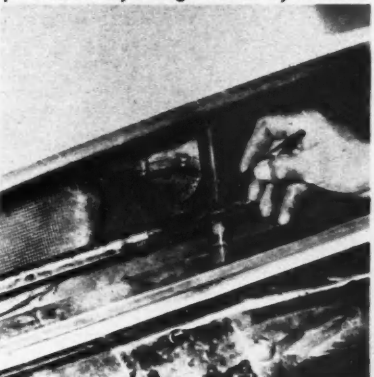
5. Grind down the weld bead, finish to perfection by filing absolutely smooth.



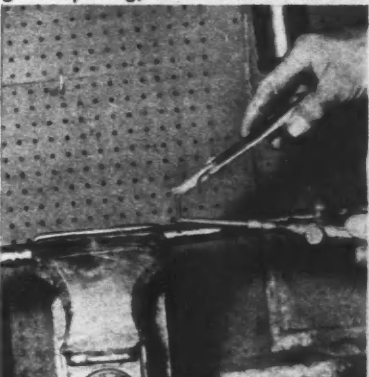
6. Braze small attaching tabs to the grille opening, drill holes for screws.



7. Brackets which come with the grille must be shortened to fit narrow cavity.



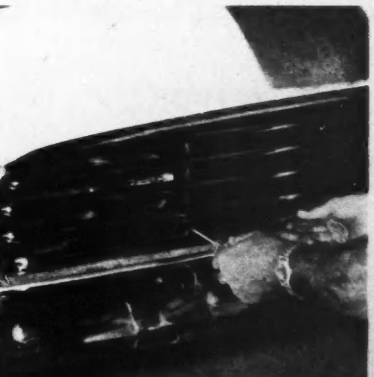
8. With brackets mounted in position, mark each bar for attachment bolts.



9. Next, braze small attachment bolts to each bar at the points just marked.



10. Align all bars and slip bolts thru mounting bracket, securing with nuts.



11. Last step consists of putting the grille in place, mounting it on tabs.



12. Completed grille installation lends clean look to front, fills out cavity.

QUARTER

ENGINE RULES AND SPECIFICATIONS

Basic engine for Class 1 and 2 must not exceed 7.3 cu. in. and/or 2.5 horsepower. ALL STOCK PARTS MUST BE FROM SAME TYPE BASIC ENGINE.

NO ALTERATIONS ALLOWED

EXAMPLE — Continental AU7R

Cam Shaft 1-216

Tappets AA7-1-301

Flywheel 95%—1 lb. 11 oz.

All engine classes must be flathead (side valve) type. No supercharging. No spraying of fuel into engine under pressure above atmospheric.

CLASS 1 (Stock Gas) one wheel drive only. Engine Maximum Size 7.3 cu. in.

Stock head

Stock head gasket

Stock block surface under head (flat surfacing allowed up to .010)

Stock dimension valves

Any type keepers

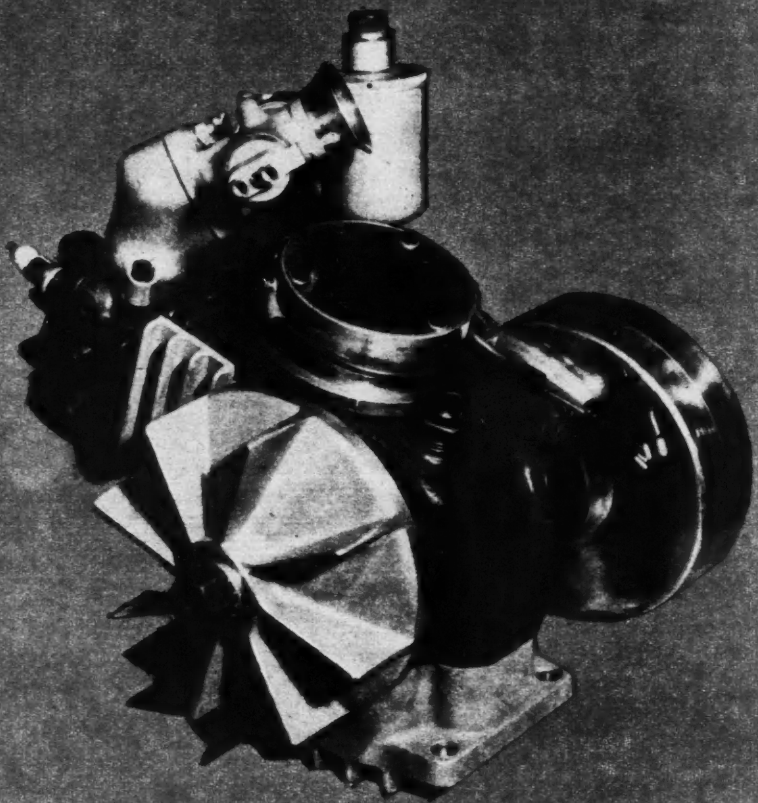
Stock intake ports

Stock exhaust ports except to remove threads only up to .875 diameter

Stock cam shaft

Flywheel weight minimum 95% of stock weight

Junior division 4 thru 8. Senior division 9 thru 15.



PART II STOCK

By Don Francisco

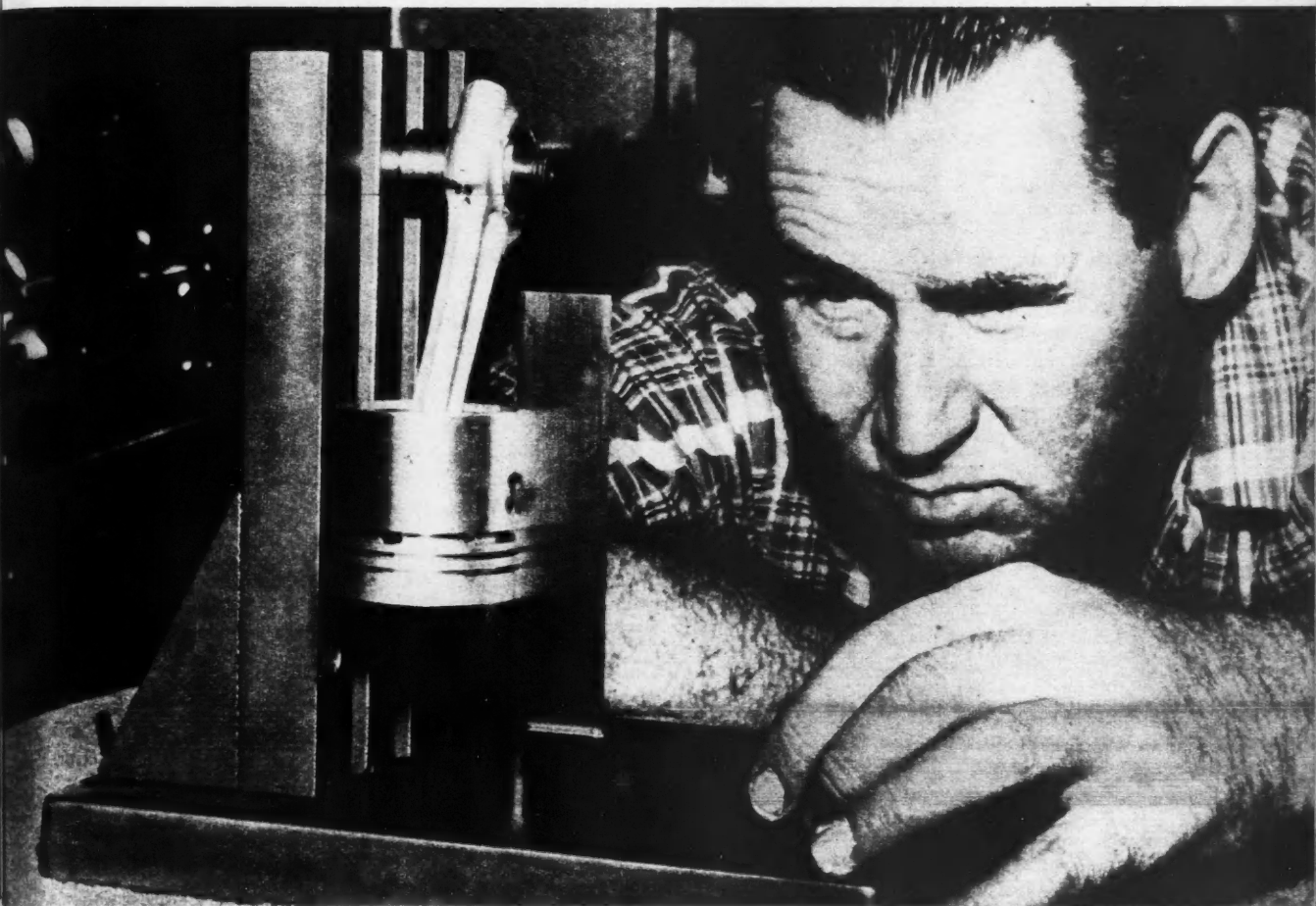
LAST MONTH, IN THE first of our current series of four quarter midget engine articles, we stated the case for the unanimous adoption of the new National Rules by the nation's quarter midget racing associations and listed the rules in their entirety. Also included in that article were rules for a Basic, or Novice, engine that are not included in the National Rules. This month we will deal with the National Rules Class 1 engine. In some associations this engine is referred to as a "Stock" engine.

Most of the modifications and special equipment that are allowed for Class 1 engines add to an engine's life rather than to its power output. Parts that do help power output are those concerned with the ignition and carburetion systems. Also, correct alignment and installation of its internal parts and the replacement of plain bearings with ball bearings often reduce an engine's internal friction. This enables the engine to deliver a greater percentage of the power its breathing system is capable of developing.

National Rules Class 1 engines must comply with the following specifications:

Basic engine must not exceed 7.3 cubic inches nor have a factory rating of over 2.5 hp.

MIDGET ENGINES



It must be of the L-head (flathead or sidevalve) type.

Supercharging is not allowed.

Spraying of fuel into the engine at pressure above atmospheric is not allowed.

Stock cylinder head.

Stock cylinder block surface under the head (machining up to .010-inch allowed to flatten the surface).

Stock dimension valves.

Any type valve spring keepers.

Stock intake port.

Stock exhaust port (port may be enlarged to a diameter of .875-inch to remove threads).

Stock camshaft.

Flywheel weight: 95 percent of stock.

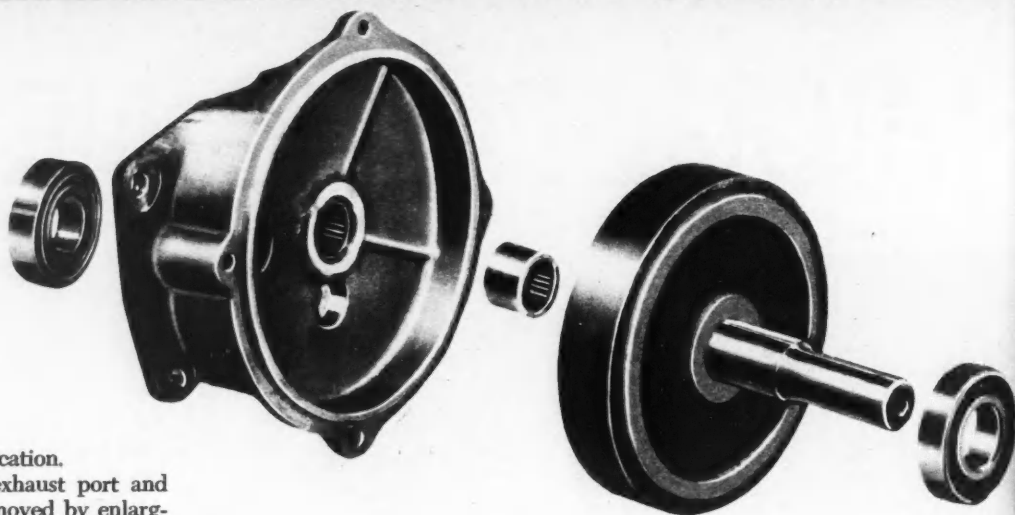
Stated in the National Rules are the things an engine must have. The rules don't give the full story by listing the special equipment an engine may have and the

modifications that may be made to it. To make it easier for a fellow planning to build an engine, we will list the special equipment that may be installed in a Continental AU7R to make it a Class 1 engine, the modifications that may be made to it, and describe how the equipment is installed and the modifications are made by Kong Jackson, of Jackson Engineering, Research, and Design in Glendale, Calif.

Several things may be done to the cylinder block. It is permissible to machine its surface on which the head gasket rests a maximum of .010-inch. The purpose of this is to replace the rough surface some cylinder blocks have with a smooth surface that will give the head gasket a better chance of holding combustion pressures. It is practically impossible for a head gasket to seal correctly on a rough surface. Another advantage of this machining is that it raises the engine's compression ratio a slight amount. For this reason alone it is

CONTINUED

QUARTER MIDGET ENGINES



an advisable modification.

Threads in the exhaust port and passage may be removed by enlarging them to a diameter of .875-inch. This should be done with a power-operated reamer but it can be done with a grinder if care is taken to make the passage the correct diameter and to not round any corners where it joins the valve port. No other work may be done in the port or passage. It is permissible to machine the surface of the port's flange to make it smooth. Also, two holes may be drilled in the flange and threaded, as described in last month's article, to make it possible to bolt a flange exhaust pipe to the port.

Some late model cylinder blocks have intake ports and passages that are $1\frac{3}{16}$ -inch in diameter compared to the $\frac{3}{4}$ -inch port and passage in older blocks. It is permissible to enlarge the port and passage in an older block to $1\frac{3}{16}$ -inch to bring them up to the later specification. This can be done with an end mill or drill. Stop where the port changes direction. No hand grinding or polishing of the passage's surfaces is permitted, nor can radiuses or corners between the passage and the valve port be blended or altered in any way.

Valve guides of any type may be installed for both the intake and exhaust valves. Common practice is to enlarge the original guides with a drill and then ream the enlarged holes to make them straight and of the correct diameter for new guides of the replaceable type. So that the new guides will be as nearly concentric as possible with the valve seats, the drill should be aligned as closely as possible with the original guide bores. Correct alignment will minimize the amount of grinding that will have to be done to obtain full seats. The new guides are press-

Continental has available a gearbox and sun gear which differs from their stock components in that it is made of heavy duty aluminum, beefed up. Price: \$56.

ed or driven into the reamed holes. Their bores are then reamed with a .281-inch ($\frac{1}{32}$ -inch) reamer to provide the correct clearance for the valve stems. Most guides used for this purpose are special items. They are available from distributors of quarter midget parts.

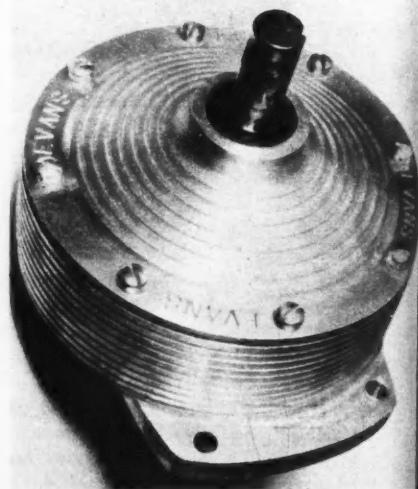
Late model cylinder blocks have a .910-inch diameter intake valve in comparison to the .850-inch valve in earlier blocks. The intake valve port in early blocks may be enlarged for the installation of one of the larger valves. This should be done with a reamer that will make the port as concentric as possible with the valve guide. A concentric port will reduce the amount of grinding necessary to establish a valve seat.

After work has been completed in the intake and exhaust ports and passages, new guides have been installed, and the intake valve port has been enlarged for a .910-inch valve, the valve seats can be ground. It would be advisable to grind new seats regardless of whatever other work was done to the block, but new seats become absolutely necessary after new guides have been installed. The reason for this is that it is extremely unlikely that new guides will be concentric with the original seats. The result of this condition would

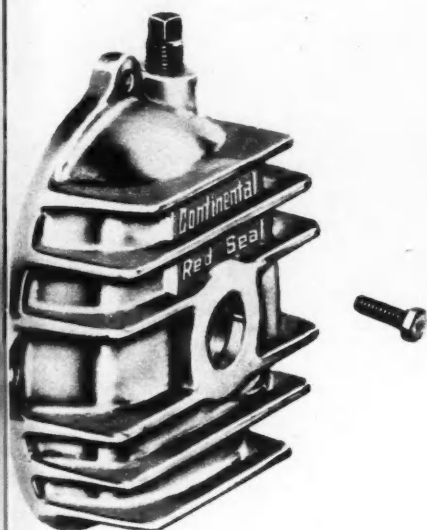
be poor valve seating, which would lower compression and combustion pressures in the engine.

Valve seats must be ground with a stone that rotates on a pilot inserted in the valve guides. The grinding should be continued until the seats are round and smooth. It is not permissible to narrow the seats by grinding either their top or bottom edges. Something that must be taken into consideration when the seats are being ground is that although the valves used in the engine do not have to be stock, they must have the same head configuration, face angle, and stem diameter as stock valves.

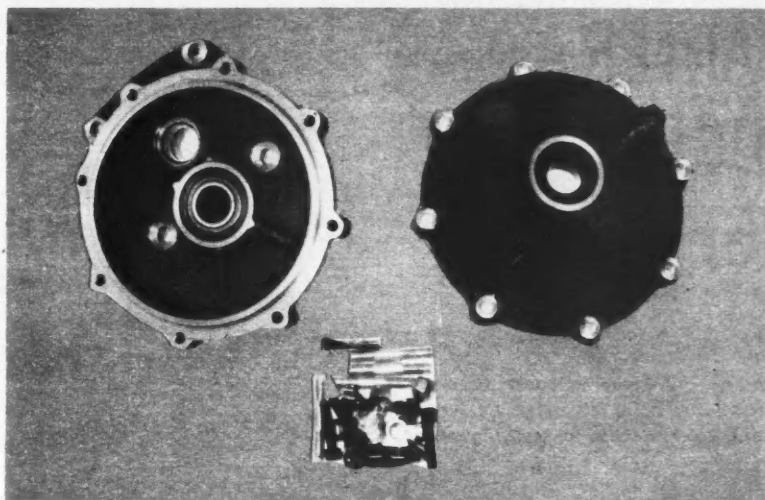
A special ball bearing adaptor of the type manufactured by Solt En-



Evans heavy duty aluminum gearbox has unique rib-type casting designed for added strength. 8 screws secure.



gines and Evans Speed Equipment may be installed on the flywheel side of the crankcase to replace the plain bronze bushing in the case. This adaptor consists of a round aluminum casting that holds two single-row sealed ball bearings and an oil seal. Its installation requires machine work on the block to remove the boss for the bronze bushing and to provide an opening in the side of the crankcase that is 2 inches in diameter and concentric with the bushing. There must be a flat surface around the opening to which the adaptor can be bolted. Holes are then drilled and tapped in the flat surface for Allen bolts that clamp the adaptor to the block. An O ring in the adap-



Solt ball bearing gearbox. Heat-treated aluminum alloy casting, heavy ribbed sections, 8 stud pattern. Crankshaft is supported on ball bearings. Price: \$52.50.

tor's block side prevents oil leaks between it and the block. Installation of such a bearing assembly is recommended because it reduces friction in the engine and more accurately positions the crankshaft.

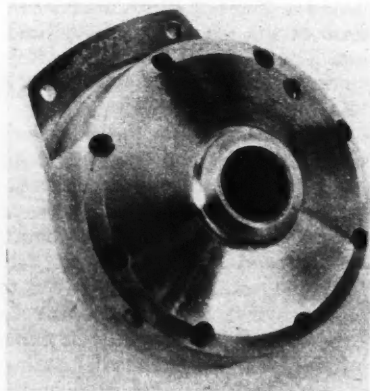
Any type of special piston may be used as long as it doesn't require alterations to the head gasket or stock cylinder head. Most special pistons are considerably stronger than a stock piston and some of them are lighter. A special piston should be installed with the skirt clearance recommended by its manufacturer. Correct clearance is extremely important because a piston that doesn't have enough clearance will create excessive friction as it moves in the

cylinder. This friction can drastically reduce the engine's power output.

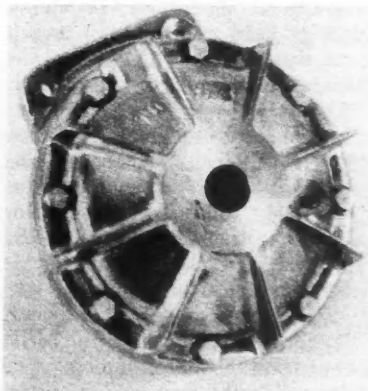
It is permissible to use any of the many makes of special connecting rods now available. Nearly all these rods are made of an aluminum alloy of some sort. They have replaceable bearing inserts and most of them use an insert made originally for a Lawson engine. The inserts are narrowed to fit the Connie crankpin by machining their sides.

A special piston pin may be used to link the piston to the connecting rod. Pins are supplied with most special pistons. Pin retaining devices

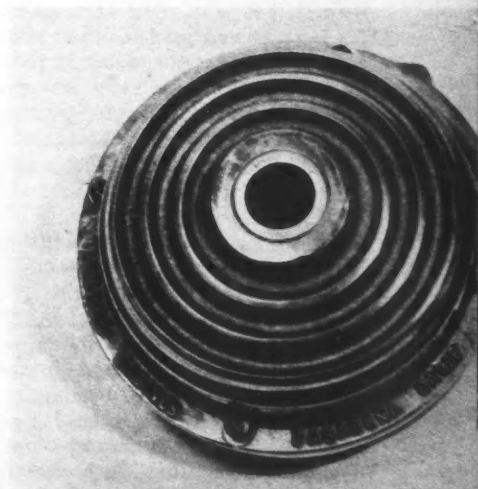
Luther circular finned gearbox features ball bearings, buffed finish. \$23.00.



Scotty gearbox is a small, compact unit which is highly polished to stay clean longer. Contains dual bearings. \$52.

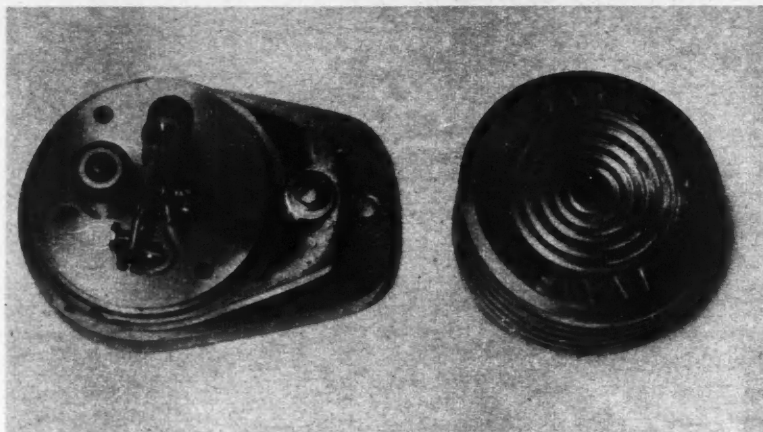


Topaz gearbox is designed with ball bearings, completely sealed to prevent oil leaks. Precision machined. \$52.50.



QUARTER MIDGET ENGINES

Evans distributor is easily accessible for quick point adjustment. Cover of distributor is cast to match gearbox.



that match the piston may be used or aluminum plugs may be installed in the ends of the pin. Aluminum plugs used for this purpose are radiused to match the curvature of the cylinder wall. They prevent excessive movement of the pin in the piston by contacting the wall. This method of controlling pin movement is more suitable for a competition engine than spring clips that fit in grooves in the ends of the piston pins or the pin bores in the piston and connecting rod must be honed to a diameter that will allow a light thumb push to move the pin through them. A pin that is too tight in either the piston or the rod can add to the engine's internal friction.

After a piston has been installed on its connecting rod it is necessary to check the assembly for alignment. This is to determine whether the piston bore and connecting rod bore in the rod are parallel and the piston's skirt is at a right angle to its pin bore. Deviations from these conditions can cause the piston to drag excessively in the cylinder and for the connecting rod's bearing to drag on the crankshaft. These things add to the engine's internal friction and can result in early failure of the rod's bearings.

Accurate checks of rod and piston alignment require some sort of jig on which the assembly can be mounted. Any misalignment found will have to be traced to its source. It could be either in the rod, in the piston or in both. As bending or twisting most of the special rods made of aluminum to correct a misalignment condition isn't recommended because of the possibility of

breaking the rod, and because of the impossibility of correcting misalignment of a piston's pin bore with its skirt, about the only way a misalignment condition can be safely corrected is by replacing the faulty parts with different parts.

Rings to be used on the piston must be checked in the cylinder to determine whether they have the correct end clearance. If a ring doesn't have adequate end clearance its ends will butt together as its temperature rises during engine warm-up. This forces the ring tightly against the cylinder wall and increases the engine's internal friction. If the expansion continues, the ring will more than likely buckle inward at some point and break.

Ring clearance is checked by inserting the rings in the cylinder, one at a time, and then squaring them with a cylinder wall by pushing them into the cylinder with the piston. The piston should be inverted so that its head contacts the ring; its skirt will align it with the cylinder. Clearance between the ends of the ring is then measured with the blade of a thickness gauge. It should be .018 to .020-inch for the top ring, .012 to .016-inch for the second ring, and .010 to .015-inch for the oil ring. Slightly more clearance than that specified won't have a detrimental effect on engine performance.

End clearance can be increased by filing one end of the ring. The easiest way to do this is by clamping a small fine-cutting file in a vise so that its cutting edges are vertical and then moving the end of the ring along the file. Install the rings on the piston, making sure they are in their correct

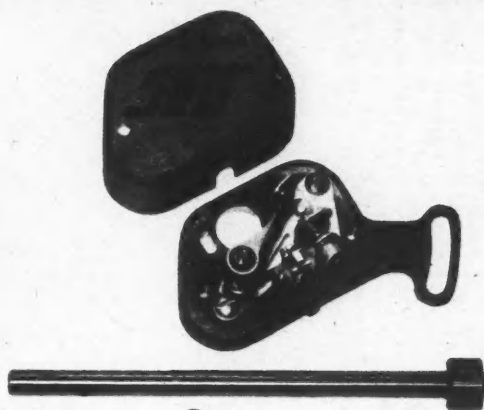
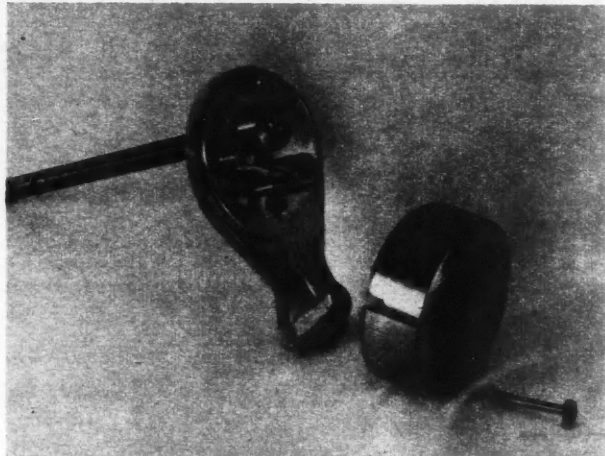
grooves and, if necessary, have their correct side up.

Two types of crankshafts are available for the Connie. The early type, part number AU7R-415, is the lighter of the two and the one that is recommended. These shafts usually benefit from a special balancing on a dynamic balancing machine. Later shafts have heavier counterweights. They are balanced at the factory and don't necessarily need rebalancing for quarter midget use.

Assembly of the engine is begun by installing the crankshaft in the cylinder block. If the block was machined for the installation of a special ball bearing on the crankshaft's flywheel side, the bearing and its housing must be installed before the crankshaft. When ball bearings are installed on either side of the crankcase it is important that the portion of the shaft that will contact the bearings be polished to a diameter that will allow it to slide back and forth in the bearings without binding. The shaft must not fit loosely in the bearings but neither must it be tight.

It is necessary that the crankshaft be free to move endwise in its bearings, regardless of the type of bearings used, so that it can seek its normal position as it and the crankcase expand and contract as they heat and cool. Endplay of .008 to .018-inch is recommended when the flywheel side of the shaft is fitted with either a plain or needle bearing. When a ball bearing is used on the flywheel side of the shaft endplay can sometimes be less than .008-inch. Too much endplay will cause excessive wear on the camshaft's driven

Scotty polished distributor, cap and shaft features easy adjustment. Complete price including shaft/cap is \$16.95.



Soft distributor, breaker cam and shaft. Hi-speed points, taper driven breaker point cam for infinite adjustment, simplified positive gap setting. Price with shaft \$12.95.

gear and too little may cause the crankshaft to drag, which will lower the engine's power output. Endplay is adjusted by installing thicker or thinner shim washers between the shoulders at the sides of the shaft's crank arms and the bearings in the crankcase.

Installation of a special reduction gear housing is a simple matter but certain precautions must be taken to eliminate drag of the ring gear and its shaft. If the gear box has ball bearings for the shaft, polish both the shaft's ends so that it can slide back and forth in the bearings. The bronze thrust washers used in stock gear boxes and ring gears are not used with a special gear box. When the cover is bolted tightly to the inner housing, the output shaft on which the engine's sprocket is mounted must have .010 to .030-inch endplay to eliminate drag in the gear box. Endplay is increased or decreased by moving the ring gear on the shaft. Moving the gear toward the inner end of the shaft increases the clearance and moving it toward the shaft's outer end decreases the clearance.

Next into the block is the rod and piston assembly. Lubricate the piston and the rings liberally with SAE 30 or 40 oil before lowering the piston into the cylinder. A ring compressor can be made from a narrow strip of thin metal formed to fit around the piston. A pair of pliers acting against right angle ears at the end of the

strip can be used to tighten the compressor. Care must be taken to prevent damaging the rings as the piston is being pushed into the cylinder.

Special connecting rods shouldn't pose any installation problems but quite often they do. This is because the manufacturers who make the rods use their own dimensions for the big-end bore and width and sometimes the dimensions aren't correct. However, in all fairness to the rod manufacturers, we must say that these conditions are becoming less and less of a problem. When a rod's big-end bore is smaller than it should be, inserts installed in it wrinkle and assume an out-of-round shape. Also, a bore will sometimes distort when the cap is bolted to the rod. This causes the inserts to distort. A wrinkled or distorted insert may drag or lock on the crankpin on which it is installed.

A rod big-end that is wider than it should be won't have enough side clearance when it is on the crankshaft's crankpin. Side clearance is the amount the big-end will slide back and forth on the crankpin. It can be measured with the blade of a thickness gauge inserted between one of the big-end's sides and the shoulder at the end of the crankpin when the opposite side of the rod is seated against the flange at the other end of the pin. It should be .015 to .030-inch. Clearance less than that specified may allow the rod to drag on the shoulders at the ends of the pin

when the parts reach their operating temperature.

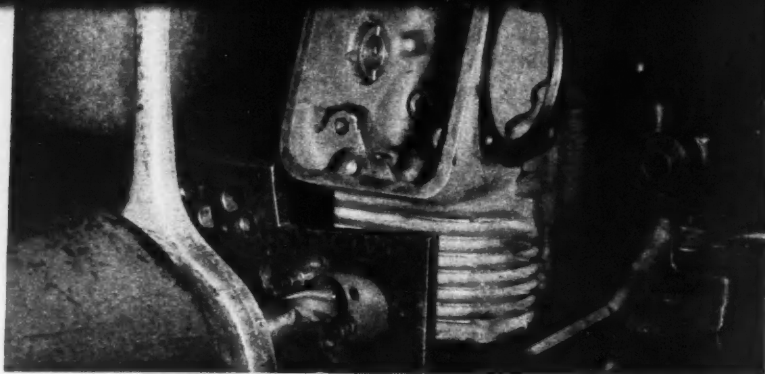
It is possible for the bearing inserts in the rod to limit side clearance. This occurs when the inserts are too wide, which causes their sides to contact the rounded fillet at the ends of the crankpins. Fillet-ride can be eliminated by forming the correct radius on the sides of the inserts with a scraper. Fillet-ride must not be mistaken for too wide a big-end, or vice versa.

After the big-end side clearance has been adjusted and the possibility of fillet-ride eliminated, the rod bearing can be checked for tightness on the crankpin. This is determined by the "feel" of the rod on the pin, or the way the crankshaft rotates when the rod and piston assembly is in the engine and the rod's cap is tight.

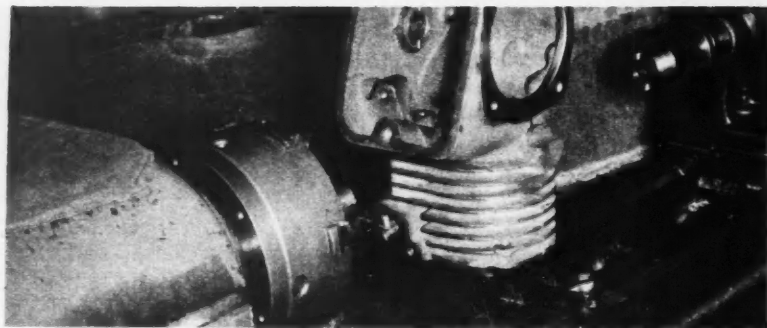
A rod fitted with a bearing of standard diameter and on a crankpin of standard diameter should slide back and forth freely on the pin, and the crankshaft should rotate without any drag. If the bearing drags or locks on the pin, the difficulty is lack of clearance between the bearing and the pin. This can be corrected with one of two different methods, depending on the actual condition. If a standard bearing is snug on a standard diameter pin but the shaft will turn, have the pin ground to .005-inch undersize and use a .002-inch undersize bearing. If a standard diameter bearing locks on a standard diameter pin, have the pin ground to

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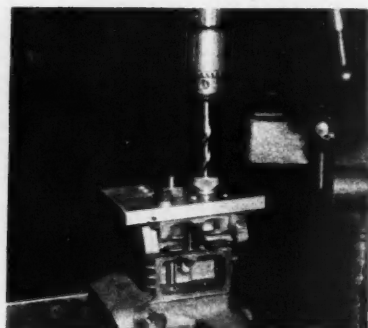
QUARTER MIDGET ENGINES



Setup Kong Jackson uses for boring the threads out of Connie exhaust passage.



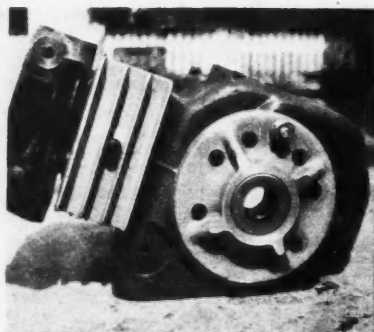
Plycutter rotated by lathe is used to smooth surface of exhaust port flange.



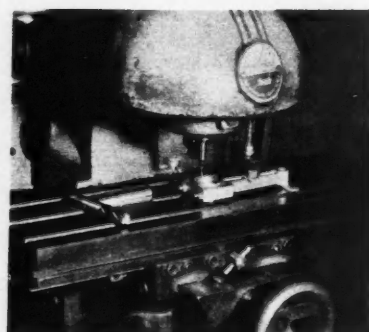
Drill jig makes new bores for special valve guides concentric with old guides.



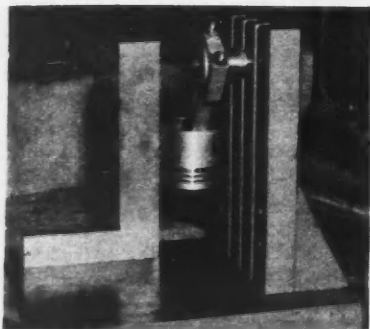
Side of cylinder block after machining for special Solt ball bearing adaptor.



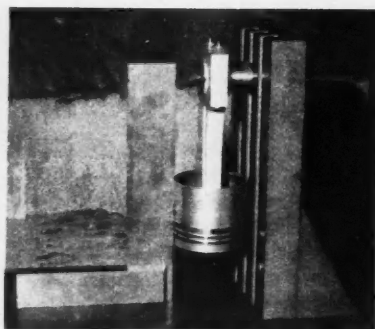
Bearing adaptor bolted to the cylinder block. Aluminum valve cover chamber.



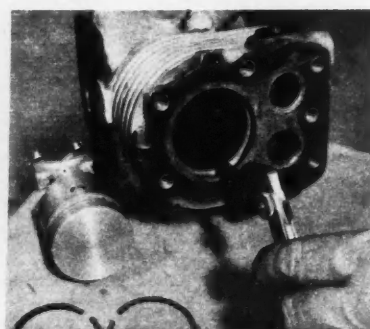
Four grooves machined in sides of rod's big-end increase flow of oil to bearing.



Jig for checking connecting rod and piston alignment. This check is for twist.



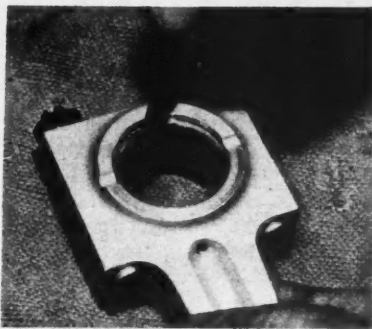
Rod's position on jig for checking for bent condition. Alignment is important.



Measuring the end gap of a piston ring before the ring is installed on piston.



Clearance between each ring and side of its groove in the piston is important.



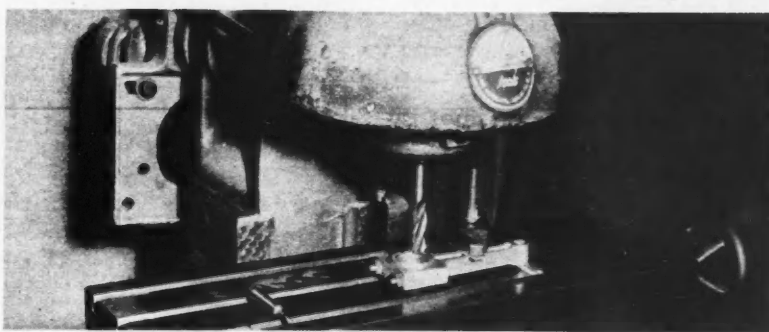
Eliminating fillet-ride by scraping the ends of the bearing inserts in the rod.



Moving connecting rod back and forth on crankpin to determine bearing's fit.



Measuring connecting rod's side play on crankpin with thickness gauge blade.



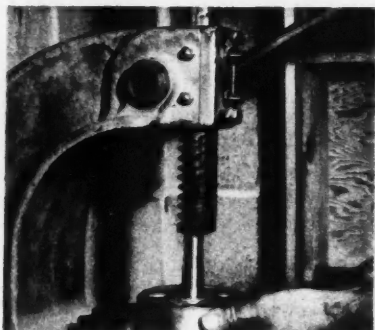
Machining the side of the rod big-end to increase side play on the crankpin.



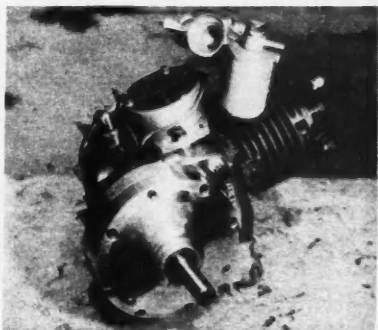
End play of the crankshaft in its bearings is measured with thickness gauge.



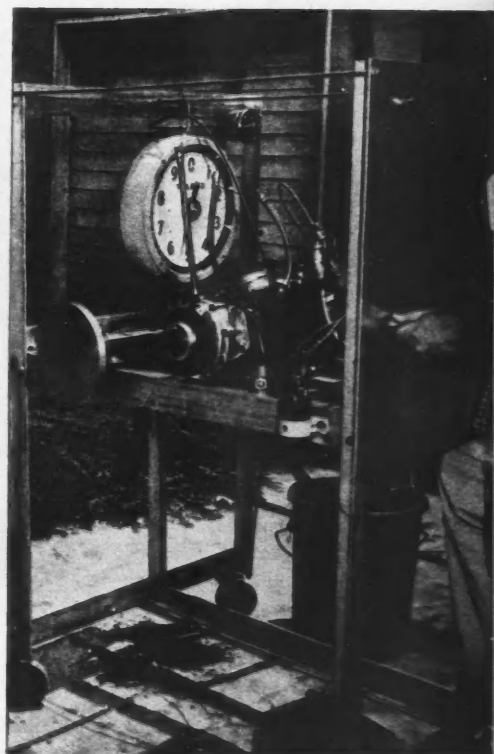
Checking fit of the ring gear shaft in the ball bearing in a special gear case.



Position of shaft in the ring gear determines end play of the gear in its case.



National Rules Class 1 engine, assembled, ready for installation in chassis.



After tuning, the engine's output rose to 3.36 hp at 6200 rpm on the dyno.

QUARTER MIDGET ENGINES

.005-inch undersize and use the standard bearing. The rod should be free on the pin after either of these corrections has been made. Any make or type of oil dipper may be used on the rod.

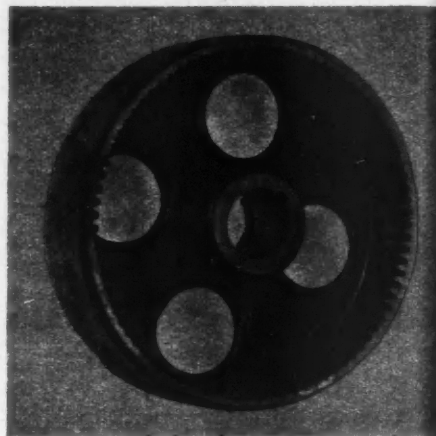
A special ignition breaker point assembly is installed in the engine in the same manner as a stock unit by inserting its shaft through the block and the camshaft. The camshaft is locked to the ignition shaft with the stock pin. Adjust the breaker points so that they open the amount specified by the manufacturer of the unit and then rotate the breaker plate to the position that causes the points to open when the piston is between $\frac{1}{8}$ and $\frac{1}{16}$ -inch from the top of the cylinder on its compression stroke. The methods described in last month's issue for the Novice engine can be used for determining the point opening time. More than likely it will be necessary to change the timing slightly from that specified when

tuning the engine for different atmospheric conditions and altitudes.

It will be necessary to install a battery and an ignition coil in the car for the special ignition system. A small six-volt motorcycle battery should be used and the best of these, because of their size and light weight, are of German and English manufacture. The German and English batteries have a rating of 12 ampere-hours and are available at most places that sell quarter midget parts. It is important that a battery always be in a fully-charged condition before it is used for competition.

For a coil, use a 1955 Ford six-volt, or a German Bosch, or a Lucas, which is made in England. Use German and English coils what were made originally for motorcycles. When wiring the ignition system, connect the grounded side of the battery directly to the breaker point housing. This will minimize voltage drop in the system.

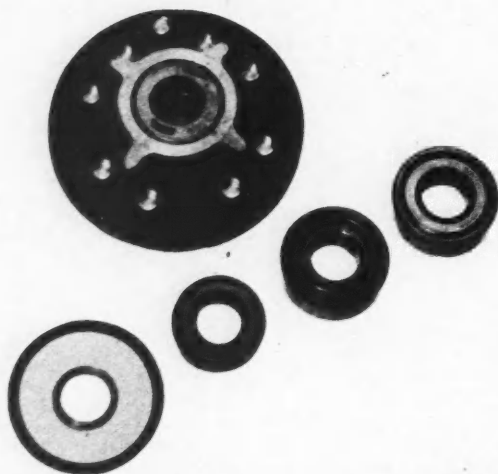
Any flywheel, as long as its weight is at least 1 pound 11 ounces, which is 95 percent of that of a stock wheel may be used. Use the stock nut and lock washer and a flat washer of the correct size to secure the wheel to the crankshaft. Lock the shaft to prevent its turning while the nut is being tightened to approximately 60 foot pounds with a good torque wrench by placing a clean piece of wood or plastic between the crankshaft and the inside of the crankcase.



Solt sun gear is machined & balanced for smooth performance. Gear teeth are chamfered. Gear with shaft is \$26.95.

Any make or type of oil sump may be used. There are no restrictions to the installation of a special oil pump of some sort or other special lubrications system in the engine. Recommended oil viscosities are SAE 40 for warm weather and SAE 30 for cold weather.

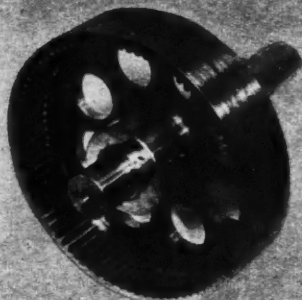
Clearances for the valves should be adjusted before the valve springs are installed. This is a fairly complex affair that involves the timing of the valves as well as their clearances. For a stock camshaft the timing figures are intake opens 9 degrees before top center, intake closes 36 degrees after bottom center, ex-



Soft ball bearing adaptor. Duplex ball bearing for flywheel side of crankshaft. Designed to lend a rigid support for crankshaft adding life to the shaft and increased engine performance. Heat-treated aluminum alloy housing. Price: \$16.95.



Evans version of the ball bearing adaptor is this rugged unit for reducing engine friction, raising performance.



Luther sun gear is machined from chrome moly steel. Has chamfered teeth to avoid crumbling. With shaft: \$14.50.

haust opens 55 degrees before bottom center, exhaust closes 10 degrees after top center. The clearances are adjusted to make the valves open and close at the correct times in relation to the positions of the piston in the cylinder, as determined by a degree wheel attached to the crankshaft. However, the lateral position of the crankshaft in the cylinder block also affects valve timing because of the relationship of the camshaft driving gears on the two shafts.

The crankshaft's lateral position can be changed by installing shim washers of different thicknesses between the shoulders on the crankshaft and the thrust surfaces in the crankcase. Moving the shaft either way changes the valve timing approximately 1 crankshaft degree, as measured with a degree wheel, per thousandth-inch of movement. The shaft should be positioned so that the valves open and close at the correct times when their clearances are .008 to .012-inch for the intake and .010 to .014-inch for the exhaust. After the shaft has been positioned, it must have the endplay specified in the section on crankshaft installation.

Check the clearance for a valve with the blade of a thickness gauge when the valve's tappet is on the heel of its cam. Hold the valve tightly against its seat while the clearance is being checked. Clearance is increased by grinding the end of the stem in a suitable attachment on a valve facing machine or with some other device that will guarantee that the ground area will be square with

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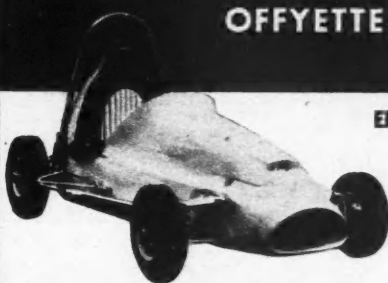


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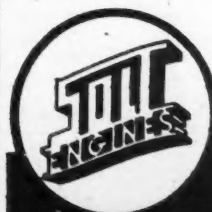
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QUARTER MIDGET ENGINES



Solt intake manifold and Amal carburetor. Aluminum alloy matching carb to intake port. Furnished with four socket head screws. Manifold: \$3.95.

the stem. Clearance is decreased by grinding the valve's face in a refacing machine.

After the valve timing and clearances have been adjusted, be sure to check the upper end of the connecting rod in the area around the piston pin to be sure it isn't touching the piston. If the rod is touching the piston, machine the piston in the contact area to provide clearance.

When special valve springs or other parts in the spring assemblies are installed, clearance between the coils of the springs must be checked when the valves are in their full-open position. If the coils touch each other, or "bottom", before or when the valves reach their full-open position, the pressure on the tappets and cams will be so high that it will cause the

parts to wear excessively or, possibly, break. Such a condition must be corrected by using either different springs, different spring retainer washers, or different valves.

Installation of the cylinder head and its gasket is simply a matter of bolting them to the cylinder block. Some engine builders replace the standard capscrews with socket-head Allen capscrews of the same length.

Allen capscrews are made of heat treated steel, making them less apt than standard capscrews to stretch or strip while they are being tightened. It is a good idea to use flat washers on the capscrews to prevent their heads from cutting into the soft cylinder head material.

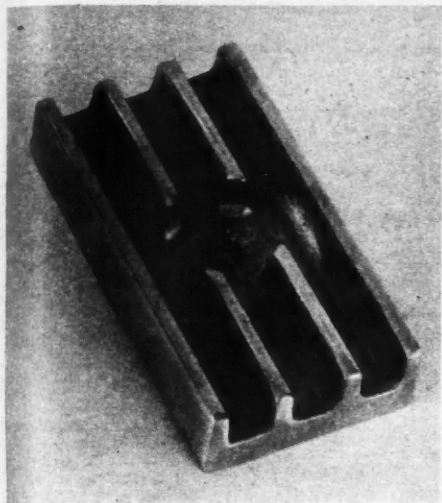
Special intake manifolds and carburetors of many types are now available for Connie engines. It is per-

Scotty intake manifold shown with Amal carburetor. The manifolds are available in several different bends, allowing varied choice of mounting positions. The price is \$5.50.



Topaz intake manifold will fit any 2 or 3 horsepower Continental block. Carburetor flange fits both 3/4" and 7/8" Amal carb. Sets float-bowl in vertical position. Price is \$4.85.





One of the items for dressing up an engine, a Scotty valve cover. \$3.25.

missible to use any of them. Be sure that the joints between the carburetor and the manifold and the manifold and the cylinder block are airtight to minimize the possibility of air leaks in the induction system. One or more air leaks between the carburetor and the cylinder can reduce the engine's power output. Leaks of this type can be hard to detect. Sometimes they exist only when the engine is hot because of the distortion of the parts caused by the heat. One indication of a leak is when the engine doesn't respond to carburetor jet changes.

NEXT MONTH

PART III:

"MODIFIED" ENGINE

National Rules and Specifications

Complete Engine Modifications

Speed Equipment Buyer's Guide

NOVEMBER, 1959

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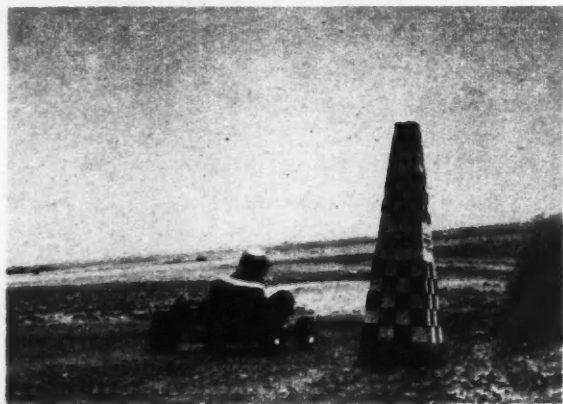


GO KART ENDURO

SCARCELY TWO WEEKS had passed since the Go Kart Nationals when we at CAR CRAFT were notified of a week-long endurance run being undertaken by Go Kart Manufacturing Company at the Willow Springs sports car and motorcycle road-race course near Lancaster, California.

Measuring $2\frac{1}{4}$ miles, the Willow Springs course was the scene of activity for seven days and seven nights. The small Go Kart made a total of 2,104 tours around the track for a total distance of 5,250 miles. Over-all average speed for the week long record run was 31.31 miles per hour. One lap run was timed at 2:52.3 for an average of 52.23 MPH.

A total of 28 individual drivers were used during the week, with the worst problem confronting them being the heat. The temperature was as high as 118° during parts of the day and would dip to a 'low' of 80° during the evening hours, with one exception when it reached 55°. Then, they were cold.



Rounding the Mobil pylon on one of the 2,104 laps completed by the Go Kart team is the endurance car. During night runs, a car would follow the kart with headlights on.



A refueling and driver change stop is made under the glaring sun. Over 100 gallons of Mobilgas 'R' were used in run, averaged 52 MPG. One full set of slick tires were worn-out during week.

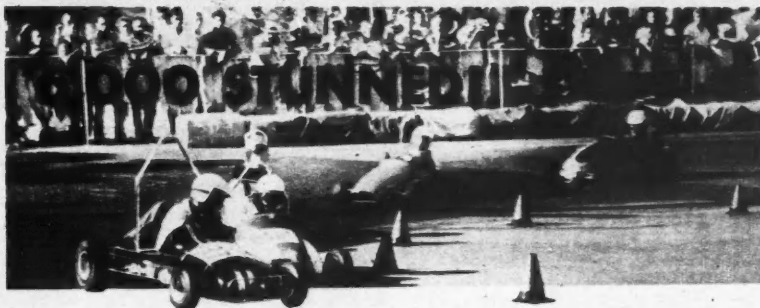


Standard model Go Kart had West Bend #700 engine, #40 roller chain instead of stock 35 size. Large bar up front is to ward off blows from jack rabbits, etc. Makeshift tank replaces stock unit lost due to intense vibration.



Adjustable tie rod was welded securely by Duffy Livingstone to prevent loosening. To no avail, later the weld broke.

NOVEMBER, 1959



LUTHER (Viper) Quarter Midgets SWEEP 5 out of 9 at the TULSA NATIONALS

LUTHER Viper champ, Kenny Byer, of Tulsa, Oklahoma, basks in the victor's spotlight as admirers crowd around following his outstanding championship performance. Son of the Tulsa LUTHER dealer, Clyde Byer, Kenny logged fastest qualifier, was unchallenged throughout the preliminary heats... then swept Senior Stock Main Championship (hands down).

RUCKER HINSON stormed into 2nd place Junior Stock Main on the heels of champ (Sugar) WATKINS, Little HINSON, Dallas, Texas, driving the sensational LUTHER Viper found Sugar Watkins also in a Viper, his only threat... scoring a 1-2... LUTHER victory.

Junior "B" Modified Champion, JOHN CUREY of Dallas, Texas, pointed his LUTHER Viper towards the winner's circle and proceeded to fight off all challengers to again place LUTHER the winner.

Heroic little David (Sugar) Watkins, racing only one year, has shocked the midget fraternity with 80 first and second place wins, hit the Tulsa Nationals like a cyclone, winning Junior Stock Championship... another LUTHER Viper triumph.

LUTHER Viper Quarter Midgets scored the biggest array of championship victories in Quarter Midget HISTORY! Stunning over 6,000 with 5 top wins out of 9 against 156 of the country's foremost drivers.

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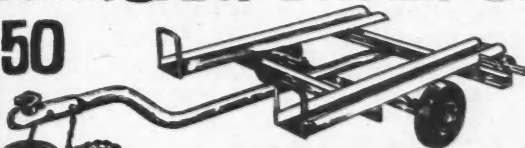


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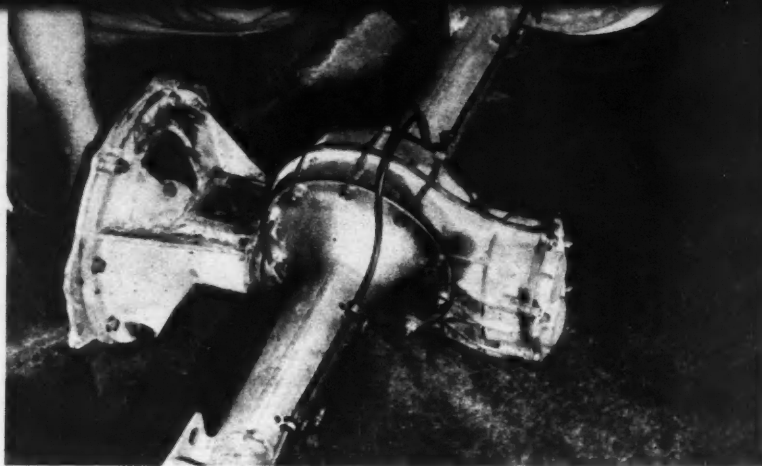
Here it is, fellows and dads! The newest, lightest, all-steel trailer for transporting your Q-M or Cart. Weighs less than 100 lbs! High-speed roller bearing wheels... Also available for 1/4 midgets and 1/4 tandems... Custom hitches too... Standard, \$12.95; Chrome, \$16.95. Order now or write for information on trailers and hitches. Fully guaranteed!

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QUICK CHANGE CONVERSION

A single unit transmission and quick-change rear end is also available for use in competition cars where an extreme engine set back is advantageous.



subtracted from the original length thus determining the proper location to cut each Ford housing. In the case of a late housing end being of a small diameter and fitting loosely into the modified Ford housings, a sleeve spacer may be necessary to center the units together. After carefully checking all measurements and angles the parts may now be spot welded together with the use of an arc-welding unit. The housing assembly should be placed on a large lathe where it can be properly straightened and finish welded. To simplify the assembly of the modified rear axle unit we shall take the complete procedure in steps.

STEP 1. The right axle housing and gasket are to be positioned on the quick-change center section and torqued to approximately 30 foot pounds.

STEP 2. After close examination of the Ford carrier bearings and races the ring gear is bolted in place on the spool or spider cage and positioned in the quick-change center section.

STEP 3. The left axle housing and gasket may be positioned in place on quick-change unit and properly tightened as in step 1.

STEP 4. Installation of inner axle seals will be necessary in many late rear housings at this point. If your particular housing uses the outer seal only or a sealed bearing unit type seal this step may be disregarded.

STEP 5. After installation of new axle seals the stock axles, bearings, and backing plates are ready for assembly. This is accomplished exactly as if you were assembling a

stock unit. With the rear axle assembled you will notice the four-bolts retaining the backing plates and axle seals also serve as an adequate safety hub which will eliminate the chance of losing a wheel due to axle failure.

STEP 6. The complete rear axle assembly may be positioned under the car and bolted in place. Stock universal companion flange may be slipped over the input shaft of the quick-change and the drive shaft bolted in place. In some cases the drive shaft must be shortened. If this is necessary it should be done in a machine shop in the same manner as the axle housing by the use of a large lathe. With the rear axle assembly under the car you can slip the desired ratio in and be ready for anything. With the new eighth mile distance becoming a new aspect of the drag racing sport, this modification is destined to become popular with competition minded enthusiasts.

Now to eliminate our second problem which deals with the installation of heavier axles in a Ford rear end. There are two excellent methods of eliminating this problem. We shall take the simplest method first. The parts necessary to complete this modification are:

Cyclone quick-change with 3 gear changes	250.00
Spool	35.00
Special heavy duty axles (each)	16.00
Special safety hubs (per set)	48.00

The assembly of this unit is a very simple operation and can be accomplished by the following steps.

STEP 1. The right axle housing and gasket are positioned in place on the quick-change center section

and the necessary bolts are torqued to 30 foot pounds.

STEP 2. The ring gear is bolted to the spool unit and placed in the center section, taking care to inspect the carrier bearings and races.

STEP 3. The left axle housing and gasket are positioned on the quick-change unit and also torqued evenly to 30 foot pounds.

STEP 4. Both special axles may now be slipped into place and the special safety hubs installed as shown in the picture captions.

The second method to solve our axle problem is somewhat cheaper but requires a little more work. This modification is very similar to the one required to install the quick-change into the late rear end.

The parts necessary for this modification are:

One late model axle housing, two axles, and a matching carrier assembly with spiders. (see a)	20.00
Cyclone quick-change with 3 gear changes.	250.00
Special spool unit. (see b)	35.00
Special reworked carrier and ring gear. (see c)	20.00

- If a spool or solid type rear axle unit is desired it will not be necessary to purchase a used carrier unit.
- When ordering the special unit be sure to specify the year and model you intend to modify.
- Send a used carrier assembly including spider gears of the same type you intend to modify. Also send the ring gear from your quick-change unit.

This particular installation is normally used in all-out competition with an unsprung chassis but is easily adapted by welding spring hangers on the unit to accommodate the Ford spring.

This modification is accomplished by following these simple steps.

STEP 1. The over-all width of the rear axle assembly must be decided on. The outside ends of a late housing must be cut off to approximately 4 inches long. These ends are now measured. Remembering that approximately one inch of each end will stick into the Ford housings, the length to cut the Ford units may be determined.

STEP 2. It may be found in some cases that the late housing diameter is much smaller than the inside diameter of the Ford housing and a sloppy fit is evident. If this problem exists a spacer must be made to center the pieces properly.

STEP 3. The prepared pieces may now be spot welded in place with an arc-welding unit.

STEP 4. The complete axle housing must now be placed in a large lathe and checked for alignment. The finish welding may now be completed.

STEP 5. The modified rear axle unit is ready for assembly. The right axle housing and gasket are positioned in place on the quick-change unit and the necessary bolts are torqued to 30 foot pounds.

STEP 6. The ring gear is bolted to the spool or spider cage and a close examination of the carrier bearings make the unit ready for installation.

STEP 7. After installing the ring gear cage the left axle housing and gasket are installed in the same manner as step 5.

STEP 8. Both axles may now be slipped into place. If a change in the over-all stock width has been made it may be necessary to shorten and respline the axles. This can be done by any competent machine shop for approximately three dollars each.

STEP 9. The remaining assembly is accomplished with the same procedure. This unit will not need any custom type safety hubs as the late axle housing ends contain a suitable hub as a stock feature.

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1949-59 Chev

1949-50 Olds

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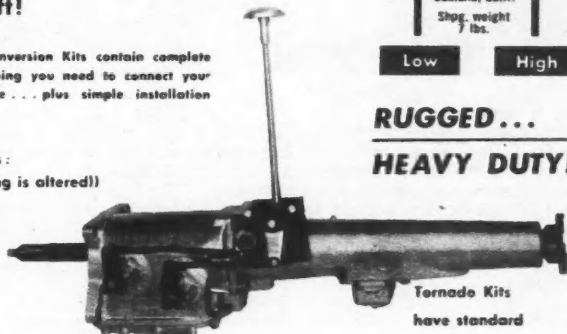
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"IS IT LEGAL?"

Southern California, possibly as other areas of the country, is currently experiencing a terrific influx of vehicle violations concerning miniature cars being illegally operated on highways, residential streets, and large parking lots. This practice is not only very dangerous to the drivers of these cars, but is in direct violation to almost all state vehicle codes. To this date there have been several fatalities, and numerous injuries directly attributed to irresponsible parents who condone this practice. Police authorities and highway patrol officers are now concentrating special efforts to curb any further mishaps of injuries due to neglectful parental supervision. Parents in most cases are being held responsible for the action of the minors. Needless to say, the penalties of the courts are anything but mild, and rightly so. Below you can read thru the vehicle code of California governing miniature vehicles which are self-propelled to define the legality of your car.

1. Sec. 32, C.V.C. Motor Vehicle is a vehicle that is self-propelled. All miniature cars when equipped with an engine are motor vehicles, so are subject to all laws pertaining to the operation of motor vehicles.
2. Sec. 250, C.V.C. Only licensed drivers may operate motor vehicles on public streets or highways. Subject to a few exceptions, no persons under the age of sixteen (16) will be issued a license. Parents can be held responsible for permitting his child or some other unlicensed person to operate a vehicle.
3. Sec. 697, C.V.C. All vehicles must be properly equipped before being operated on public streets or highways. Most miniature cars are not equipped with such legal items as brakes, lighting, horn, windshield, wipers, etc.
4. Sec. 140 C.V.C. Subject to few exceptions, all vehicles must be registered before being operated on public streets and highways. The Department of Motor Vehicles will not license a vehicle until it complies with all the required laws; most miniature cars do not comply to these laws.

As can be clearly defined from the above vehicle code sections, the small miniature car cannot be operated legally on the streets or highways until various sections of the code are complied with. These vehicles can be operated on private property with the owner's consent (preferably in writing). But no matter where they operate it should never be in conflict with normal vehicle traffic such as market parking lots or on sidewalks designated for pedestrian travel.

It is advised that if you are in any doubt as to regulations and laws governing these miniature cars—contact your nearest local enforcement agency.

FLORIDA TANGERINE NATIONALS

December 26th thru 29th will be big days in Orlando, Florida, where the Orlando Junior Chamber of Commerce will host the nation's quarter midget enthusiasts for their first annual southern holiday race meet. Four big days of activity are planned with qualifying of all cars to commence Saturday the 26th. The Orlando quarter midget track is asphalt surface, banked, and measures the standard 1/4th of a mile in length. Entry fee will be three dollars and is to be applied for

fifteen days before race dates. Post entries will be accepted, but a penalty of one dollar will be added to the initial fee. Ample accommodations are available near the race site. The following rules and specifications will govern all racing classifications.

ENGINE SPECIFICATIONS:

STOCK: Junior Divisions age 4 through 8 — Senior Division age 9 through 15. FUEL: Gasoline only, no additives. ENGINE: 7.3 cu. in., air-cooled, 4 cycle engines in this division must remain stock except for the following: Valve-kits may be installed so long as valves are of stock dimension. Valve guides may be installed. Flanged exhaust pipes may be installed but threads may not be removed. Ignition timing may be changed at points only. You may relocate the point cam and install Allen screw. Breathers may be installed. Dipper modifications allowed. Additional holes in pan allowed. Nuts, bolts, studs, washers, gaskets (other than head gaskets), governor, pulley, screen, air cleaner, gas lines, exhaust pipe, points, and condenser not to be classed as part of engine.

MODIFIED STOCK:

Junior Divisions age 4 through 8. Senior Division age 9 through 15. FUEL: gasoline only, no additives. ENGINE: 7.3 cu. in., air-cooled, 4 cycle. All modifications allowed in this division except for the following: Stock head, no milling allowed, stock head gasket, stock part size, no polishing allowed, stock valve size (at head), stock compression, stock cam-shaft, (AU7/216) for Continental no alterations allowed. Threads may be removed from exhaust port and flange installed. Flywheel must be 95% of manufacturer's weight with min. weight being 27 oz.

"B" MODIFIED

Junior Division age 4 through 8. Senior Division age 9 through 15. FUEL: gasoline only, no additives. ENGINE: 7.5 cu. in., air-cooled, 4 cycle. All modifications allowed in this division except for the following: No alterations of stock cam-shaft, flywheel must be 95% of manufacturer's weight with min. weight being 27 oz.

A GAS:

Ages 4 through 15. Engine displacement must not exceed 8.0 cu. inches. Gasoline only, to be furnished at meet.



Dave Watkins of Garland, Texas, recent Tulsa National Champion in Junior Stock division accepts McHail Midgeteer Helmet Sportsmanship award from sales rep, Slim Wycoff, Dave, handicapped since birth, finds QM's his first love and takes no back seat to any competitors. His mantle boasts some 49 trophies for only one year of midget car driving.

AA OPEN FUEL:

Ages 4 through 15. Engine displacement must not exceed 8.3 cu. inches. Fuel (straight methanol) or gasoline furnished at meet.

NOTE: Gear-boxes are not considered a part of the engine in any division, therefore any type gear reduction allowed. All divisions, one wheel drive only. No over-head valves. No blowers. No fuel injection.

All winning car engines will be impounded after each event and inspected by technical crew.

For additional information regarding entry blanks, accommodations, facilities, write: James Bradshaw, Orlando Junior Chamber of Commerce Quarter Midget Association, P.O. Box 2047, Orlando, Florida.

TRACK LISTINGS

FAIRFIELD, CALIFORNIA

Fairfield Quarter Midget Racing Association

TRACK: asphalt. RACE DATE: every other Sunday 2:00 P.M. first race. QUALIFYING: starts at noon. RACING CLASSIFICATIONS: Novice. Stock classes only Junior division (4-8) Senior (9-15) GENERAL RULES AND REGULATIONS: All cars must be equipped with the following safety features... approved roll bar, safety belts, bumpers and nerfing bars, one wheel brake,

outside ignition switch, metal firewall and all metal frame. DRIVER: approved crash helmet, unbreakable goggles, adequate long sleeved protective apparel. ENGINE SPECIFICATIONS: 2 h.p. American made motors only. FUEL: gasoline only. TRACK LOCATION: Located at Solano Drive at Theatre corner of Hiway 40 and North Texas St., Fairfield, California.

COMING EVENTS

SHOWS

Evansville, Ind.—Nov. 7-8. 2nd Annual Mid-States Autarama, Roberts Municipal Auditorium, sponsored by Road Knights, Inc.
Des Moines, Iowa—Oct. 24-25; 5th annual International Motors Sport Show; Veterans Memorial Auditorium.
West Springfield, Mass.—Oct. 21-25; 2nd annual Rod & Custom World's Fair Auto Show, Eastern States Exposition Fairgrounds.
Chatham, N.J.—Nov. 28-29; Squires Club Auto Show, at Colonial Pontiac.
Teaneck, N.J.—Oct. 10-11; 2nd ann. East Coast Round-up at Armory, sponsored by Drivin' Deuces.
White Plains, N.Y.—Oct. 30-31; 2nd Autarama; Westchester County Center.
Portland, Ore.—Oct. 30-31, Nov. 1. Portland Roadster Show, Pacific International Bldg., sponsored by Multnomah Hot Rod Council.

NHRA DRAG SCHEDULES

Dothan, Ala.—11/10, 11. Wiregrass Timing Assn.
Helena, Ala.—1st & 3rd Sun. Birmingham Timing Assn.
Carlisle, Ark.—2nd Sun. Arkansas Timing Assn.
Little Rock, Ark.—1st & 3rd Mid-South Timing Assn.
Madera, Calif.—2nd Sun. Madera Clutchers, Inc.
Orville, Calif.—2nd & 4th Sun. Orville Clutchers.
Palmdale, Calif.—4th Sun. Antelope Valley Timing Assn.
Redding, Calif.—3rd Sun. Shasta Roadsters, Inc.
San Luis Obispo, Calif.—3rd Sun. San Luis Obispo Co. Timing Assn.
Santa Maria, Calif.—1st Sun. Dragons, Inc.
Grand Junction, Colo.—10/11, 25; 11/8, 22; 12/6, 20; Grand Junction Hot Rod Council.
Davie, Fla.—2nd & 4th Sun. Broward Auto Club.
Kissimmee, Fla.—1st Sun. & 3rd Sun. Central Fla. Timing Assn.
Lake Wales, Fla.—2nd Sun. Triangle Timing Assn.
Miami, Fla.—1st & 3rd Sun. So. Fla. Timing Assn.
Sebastian, Fla.—2nd & 4th Sun. Asphalt Angels Hot Rod Club.
Venice, Fla.—1st Sun. Vagabonds, Inc.
Oswego, Ill.—ev. Sun. Oswego Dragway.
Indianapolis, Ind.—2nd & 4th Sun. Indianapolis Timing Assn.
Parsons, Kans.—3rd Sun. Coffeyville-Parsons Timing Assn.
Hammond, La.—4th Sun. Ponchartroula Jaycees.
Opelousas, La.—1st & 3rd Sun. Pelican State Auto Club.
Sanford, Maine—2nd & 4th Sun. New England Hot Rod Council.
Orange, Mass.—3rd Sun. New England Timing Assn.
Detroit, Mich.—nightly & weekends. Detroit Dragway.
Minneapolis, Minn.—ev. Sun. Twin City Optimist Club Timing Assn.
Greenville, Miss.—1st & 3rd Sun. Delta Angels, Greenville AFB.
Belgrade, Mont.—2nd Sun. Bozeman Pacers.
Butte, Mont.—3rd Sun. Silver Bow Timing Assn.
Grand Island, Neb.—10/11. Grand Island Jaycee Timing Assn.
Lincoln, Neb.—9/20; 10/4, 18; 11/1, 15, 29. Shavunda Auto Club.
Scottsbluff, Neb.—11/4. Nile Valley Timing Assn.
Carson City, Nev.—3rd Sun. Silver State Timing Assn.
Vinaland, N.J.—ev. Sat. Nite thru Sept. Vinaland Speedway.
Hobbs, N.M.—1st Sun. Charioteers Auto Club.
Roswell, N.M.—2nd Sun. Dusters Auto Club, Walker AFB.
Elizabeth City, N.C.—2nd & 4th. Eastern Carolina Drivers Assn.
Cincinnati, Ohio—Ev. Sun. Beechmont Dragway.
Dayton, Ohio—Ev. Sun. Montgomery Co. Timing Assn.
Toledo, Ohio—Ev. Sun. Northwestern Ohio Timing Assn.
Durant, Okla.—4th Sun. Durant Timing Assn. & Durant Jaycees.
Enid, Okla.—10/25; 11/22. Playboys Rod & Custom Club.
Tulsa, Okla.—1st & 3rd Sun. Tulsa Timing Assn.
Aurora, Ore.—1st & 3rd Sun. Multnomah Hot Rod Council & Northwest Timing Assn.
York, Pa.—ev. other Sun. South Penn Hot Rod Council.
Charlestown, R.I.—1st Sun. So. New England Timing Assn.
Abernathy, Texas—4th Sun. Tri-city Drag Assn.
Caddo Mills, Texas—1st Sun. North Texas Timing Assn.
Marfa, Texas—3rd Sun. Marfa-Alpine Drag Strip.
New Braunfels, Texas—3rd Sun. Central Texas Racing Assn.
Salt Lake City, Utah—1st & 3rd Sun. Salt Lake Racing Assn.
Petersburg, Va.—ev. Sat. Eastern Dragway, Inc.
Roanoke, Va.—1st & 3rd Sun. Roanoke Dragsters, Inc.
Kent, Wash.—Pacific Motor Raceway, King Co. Youth Auto Council.
Mt. Vernon, Wash.—ev. other Sun. Bayview Timing Assn.
Deseronto, Ont.—ev. other Sun. Peaceful Pacers.

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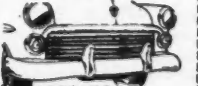
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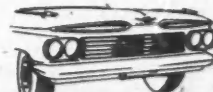
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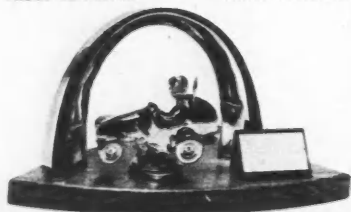
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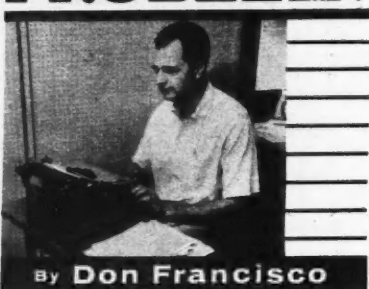
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WHAT'S YOUR PROBLEM?



FROM SLUSH TO CRASH

Dear Don:

I own a 1957 Chevy V8 that has a Powerglide transmission. I'm thinking about installing a synchromesh transmission in the car. I would like to know whether I can use the Powerglide bell housing and shifting column with the synchromesh transmission.

Also, will I have to change the rear end?

— Jack Babcock,
Roswell, New Mexico

A bell housing, or flywheel housing, made for a Powerglide transmission cannot be used with a synchromesh transmission. Even if such a switch were possible it would not be advisable because Chevrolet sells flywheel housings and transmission cases only in matched sets. The Powerglide steering column shift control unit cannot be used with a synchromesh transmission because, for one thing, it has only one shift lever arm instead of the two required for a synchromesh box.

Converting from a Powerglide to a synchromesh transmission requires all new parts from the flywheel flange on the engine's crankshaft to the rear of the transmission, plus a clutch pedal and all the clutch release linkage and the steering column shifting mechanism. Many of these parts are hard to buy from Chevrolet agency parts departments because they are parts that can't wear out, and, therefore are not carried in stock.

The best thing to do when a conversion of this type is to be made is to find a fellow who has the same make and model car but who wants to trade a synchromesh setup for a Powerglide. All you'll have to do then is strip the parts out of each car and switch them. A similar arrangement might be made with the local wrecking yard if a car that had the desired transmission could be located.

Standard rear axle gear ratios for 1957 Chevrolets that had V8 engines were 3.55 to 1 for synchromesh transmission, 4.11 to 1 for synchromesh and overdrive, and 3.36 to 1 for Powerglide. When switching from a Powerglide to a synchromesh it would be advisable to use the standard gear ratio that would match the transmission that was installed. However, as long as the higher gears were already in the rear end, it might be wise to try them with the synchro-

mesh box. They might be satisfactory for the type of driving you do. If their ratio was found to be too high, they could be replaced with gears of a lower ratio.

ONE IN THE MIDDLE

Dear Don:

After talking to everyone from the garbage collector to the turnkey at the local lockup, I still have an unanswered question. Is there any floor-shift transmission that will fit a '49 Chevy that is now equipped with a synchromesh transmission? Most any gear box will do as long as I don't have to buy an adaptor or wind up with a lower gear ratio. I just go for floor-shifts.

— Glen Williams
Wichita, Kansas

You can convert the transmission now in your car to a floor-shift with one of the conversion kits available from two or three different manufacturers. One of these manufacturers is Service Center, 15729 South Atlantic Ave., Compton, Calif. The price of the kit is \$29.95, plus about \$3.00 for a shift lever extension.

These conversion units are easily installed and they do a good job. They are used for both drag racing and normal driving.

AIR IS FOR THE BIRDS

Dear Don:

I have a '58 Impala that has an air suspension system. I would like to convert to coil springs. Is this possible? If it is, what would I have to do?

— Gerald Brown
Baltimore, Md.

I can understand why you want to get rid of the air suspension system; it's nothing but miserable.

The different makes of cars that tried air suspension were built so that installation of the air components on a standard production automobile could be accomplished as simply as possible. This was done to lower production costs of the air suspension cars.

Chevrolets that are fitted with air suspension units have the same frames, the same front suspension upper control arms, the same rear axle assembly, and the same rear axle upper control arm as cars that have coil springs. Parts for air suspension cars that differ from coil spring cars are the front suspension lower control arms, rear suspension lower control arms, and shock absorbers.

Converting your car from air to coil springs would require quite a bit of work but the job would be simplified by the fact that the original parts would be replaced with standard parts; nothing would have to be altered or rebuilt. The results would be well worth whatever was involved.

AN EASY ONE

Dear Don:

I own a '40 Ford convertible that has a stock column-shift transmission. I would like to replace this transmis-

sion with a floor-shift type. The engine is stock but I intend to mill the heads and install dual carburetors soon.

I would like to know what transmission would fit with the least amount of work and if any adapters are necessary?

—Edward Fitz Patrick
Lodi, New Jersey

This is the easiest transmission switch anybody could make. Any 1939 or earlier Ford passenger car transmission is interchangeable with the 1940 column-shift box. These transmissions are all stick-shifters. You'll have to cut a hole in the floorboard for the shift lever and its tower; otherwise, no strain.

SHOCKS DON'T LAST FOREVER

Dear Don:

The front end of my '49 Ford seems to hit the top of its spring travel on very slight bumps. Would it be OK to cut one full coil from each spring? Would this improve the car's handling?

Also, can I use a pair of 8½ to 1 heads from a 1948 Ford on my '49 block if I use '48 water hoses?

—George Snyder
Ancrumdale, N.Y.

Shortening the front spring on your car wouldn't improve the condition you describe, nor would it help the car's handling. Upward movement of the frame in relation to the wheels is resisted by the shock absorbers but there is no doubt that your shocks are worn out.

What the car needs is a good set of double-acting shocks for the front wheels. Shocks of this type resist frame movement in both directions and provide a definite handling improvement on any car.

Cylinder heads for a '48 Ford engine can be used on your block but it will be necessary to plug the water hole at the front of the right cylinder bank before they can be installed. Use head gaskets that match the heads. Another problem you'll have is that of locating the engine's ignition distributor vertically and providing a means of locking it in position. A flange at the front end of the standard right bank cylinder head normally takes care of these things.

YOU'VE GOT TO WIND THEM

Dear Don:

I have a '50 Plymouth business coupe that has a '54 DeSoto Fire-dome V8 engine. The engine now has a cam kit and mildly reworked heads. I plan to rework the engine more thoroughly at a later date. The car has its original transmission and driveline with an 11-inch Dodge truck clutch.

I don't think I'm getting anywhere near the speed I should in the quarter-mile because of the car's gearing. What suggestions do you have con-

cerning rear end ratio and transmission gears for improving quarter-mile performance with this setup?

Any information will be greatly appreciated.

—Richard Wilson
New Rochelle, N.Y.

Actual gear ratios that are best for drag racing in any car are difficult to specify unless one has had previous experience with a similar setup. The thing that gear ratios are based on is the crankshaft speed the engine must turn for best performance. Late model overhead valve V8 engines have one thing in common and that is that they must be turned tight for drag racing. Your car should be geared so that its engine will be turning approximately 7000 rpm at the end of the quarter. To turn this tight, the engine must have a good camshaft, efficient valve springs, and ample carburetion.

For example, if you are running the 6.70 x 15 tires that were standard equipment on some '50 Plymouths on the rear of your car, the car would need a rear axle ratio of 5.66 to 1 to run 100 miles per hour in high gear at 7000 rpm.

A rear axle ratio as low as 5.66 to 1 is practically impossible to find; therefore, it would be better to use second gear for dragging instead of high. A 3.10 to 1 rear axle ratio combined with the 1.83 to 1 second gear in your car's transmission would provide a final ratio of 5.66 to 1.

If your car is capable of speeds higher than 100 mph at the end of the quarter, you can use a final ratio higher (numerically lower) than 5.66 to 1. If your car won't reach a speed of 100 mph, you will need a lower final ratio that will enable the engine to turn as tight as it should. It must be remembered that rear wheel and tire sizes have an effect on the final ratio. The larger the outside diameter of the tires, the higher the ratio.

DRIVE-IN RACER

Dear Don:

What type of reground camshaft would be best for my use? I would like one with a lot of spirit and a mean idle at the stoplight. My car is a '58 Chevy with three two-barrel carburetors and a stock stick-shift transmission.

Some of my friends say that a Corvette camshaft and equipment would be best. What do you suggest?

—Dennis Campbell
Tyler, Texas

The first thing you have to do before you buy a camshaft is decide on the kind of performance you want. If your main interest is a car-shaking idle, you'll be happy with practically any all-out competition grind that can be supplied by any company that regrinds camshafts. If you are interested more in good engine performance than you are in a rock and roll idle, you'll need a much milder grind, also available from any cam grinder. As far as performance is concerned, you'll find the milder grinds more sensible in a passenger car, although less "romantic."

I suggest you discuss your problem with a reputable camshaft grinding company and then follow their recommendation.

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MERCURY MEDALIST MODIFICATIONS

Dear George:

I have already done some customizing on my '56 Mercury Medalist and would appreciate some advice on the following items.

First, I don't know which grille I should or could use. Do you have any suggestions? Secondly, what dual headlight set-up should I use? And lastly, will the Edsel taillights (station wagon) fit?

—Tom Petersel,
Morris Plains, N. J.

The grille modifications depend largely on the amount of money you plan to spend. If you have an unlimited budget, go to the canted headlights with frenched shell and a custom-made grille assembly. If, however, you don't have a large budget, think about possibly installing a '53 Chevy grille or possibly just enhancing your present set-up with small chrome bullets or perhaps a perforated or expanded metal screen behind the unit presently on your car.

For quad headlights, you might be able to adapt some later model Merc units to your front fenders, but the only trouble with this is that the fender contours are different. There might be some bolt-on units on the market now for the '56 Mercury. I know that there are several different bolt-on quad headlight kits available now and about the best advice I can give you is to try experimenting. Possibly you'll find the kit which will fit your Merc's fender contour like a gem.

To convert the Edsel station wagon lights to your rear fenders will take quite a bit of modifying, but it can be done. The main problem is, once again, fender contour. Your Merc is oblong, the Edsel round. Take it to a reputable shop in your area.

LIMITED BUDGET

Dear George:

I have just finished nosing, decking and repainting my '52 Ford. I'm trying to decide what to do next as I am working with a limited budget. Do you have any suggestions for taillights and grille replacement?

—Glenn Buchan,
Houston, Texas

Since you are on a budget, then your only alternative is to choose the bolt-on market. Lee

Plastics, 10832 Plymouth Road, Detroit, Michigan manufacture a plain lens kit which you can install in a minimum of time; the cost is only \$6.95. Before you install these plain surfaced lenses, you should add a small chrome bullet in the center. These are also very inexpensive — \$1.25 each from California Custom Accessories, 1807 W. 65th Street, Los Angeles 47, Calif.

For a grille, I would suggest you purchase a double-bar unit which is marketed for the '32 Ford by Detroit Grille Mfg. Co., 258 E. Vernor, Detroit, Michigan. Complete instructions for installation are given; the price for this is \$29.95.

CANDY COLORS

Dear George:

I have read your article on "Candy Colors", and I enjoyed it very much. Since I'm a do-it-yourself man, I would appreciate any advice you could give me.

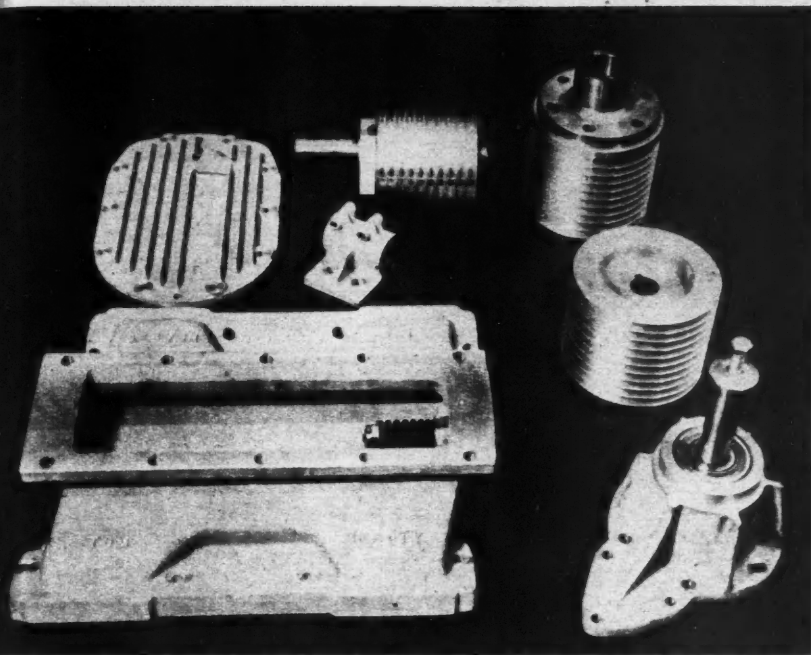
At the present time I'm in the process of making plans for my '55 Chev, which I plan to customize. Since a custom paint job is in store, I would appreciate it if you could tell me what effect I would get if I applied Cobalt Blue over a gold underbase. Do you think I would achieve a desirable effect or an undesirable effect? If you do not agree about this color combination any advice you could offer me would be most appreciated.

I would also like some information on a certain smoke paint, which I have seen used on the interiors of a great many cars. Is this paint easy to apply and is it durable? Also could this paint be applied in darker shades rather than white? I'm planning on painting my dash, and window frames in this manner if it is not difficult.

—Victor Bagdan
Detroit, Mich.

I'm sorry to say that Cobalt Blue is not a translucent toner color. These translucent toner colors can be arrived at only by mixing the different types of toners mentioned in the article. Not only must you mix these different toners, but you'll also have to experiment with various mixes and formulas before you can find the desired color you wish. The only trouble with this is that there are innumerable hues and tones which you can come up with. I would say that the best thing for you to do is to experiment and when you find your shade use it. Otherwise you might waste much valuable time in searching for the exact shade, and possibly not even find it.

Smoke paint is accomplished by painting your dash or frames with a pastel shade of paint. Then, before the paint is entirely dry, light an acetylene torch with a low black smoking flame. Let the smoke from this flame penetrate the paint on the dash before it is dry. Be careful not to burn any of the paint away. When you have finished, spray a few coats of clear lacquer over the surface so the smoke stains will not rub off.



Tom Beatty kit may be purchased with or without blower. Blower has lower flanges removed, clearance set. 4-71 kit \$380, blower \$275. 6-71 kit \$400, blower \$175.

RACING BLOWERS (Continued from page 31)

GILMER DRIVE

Tom Beatty of Beatty Engineering in Sun Valley, California, one of the pioneers of supercharging in the hot rodding field, produces both a Gilmer drive kit and a multiple V belt assembly. These kits are designed for maximum boost pressures with either gasoline or a high performance fuel. The precise machine work and functional design of the special components make these units comparatively higher priced than most.

The Gilmer belt drive assembly is one of the most widely used units in all-out competition today. The operation of this unit is very similar to the chain drive adaption. The Gilmer drive consists of a flat steel impregnated neoprene belt with extended areas which mate and lock themselves into channels machined into the crank and blower pulleys. The problem of a positive connection between the crankshaft and supercharger still exists with the Gilmer drive, but because of the low amount of horsepower required to drive this unit it is one of the best all around drive units available.

MULTIPLE "V" BELT

Although the multiple V belt kit

requires more horsepower to drive the supercharger than other adaptations, it is indeed the safest, most trouble-free driving unit available for high pressure operation. The biggest advantage in this particular type of drive is the ability to allow slippage, not in the case of driving the supercharger but in an emergency such as an explosive misfire. This small margin of safety has saved many a supercharger from destruction.

It cannot be emphasized too strongly that a lot of planning must go into the supercharging of an engine. The beginner who simply orders all the equipment he can afford may find that his machine does not respond to the treatment. Each engine and blower combination is a special case and should be treated as such. This article should help you plan.

Next month's third and last installment of the Blower series will deal specifically with the different types of fuel induction systems available and the benefits offered by each. It will also cover the adaption procedures and recommend many minor carburetion changes that will start you off on the right foot.

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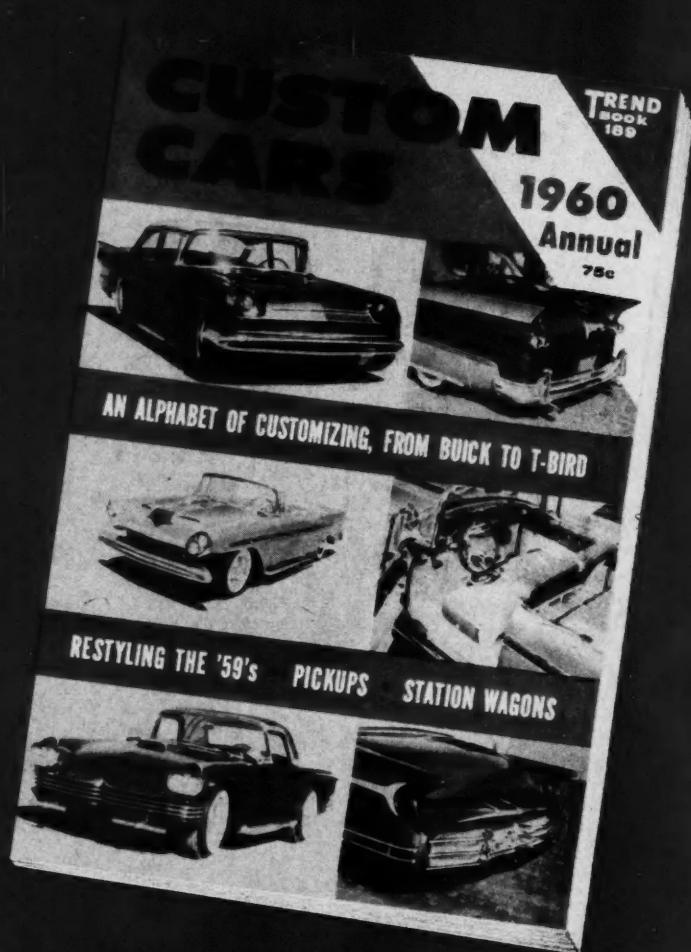
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